Doc.DOC1173696

Operation Manual

PRODUCT NAME

Wireless Remote

MODEL / Series / Product Number

EXW1-RMV#M5C

SMC Corporation

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)[*1)], and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

Danger	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
Warning	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Caution	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Safety Instructions

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Operator

- ♦This operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- ♦Read and understand this operation manual carefully before assembling, operating or providing maintenance to the product.

■Safety Instructions

⚠Warning

■Do not disassemble, modify (including changing the printed circuit board) or repair.
An injury or failure can result.

■Do not operate or set with wet hands.
This may lead to an electric shock.

■Do not operate the product outside of the specifications.
Do not use for flammable or harmful fluids.
Fire, malfunction, or damage to the product can result.
Verify the specifications before use.

■Do not operate in an atmosphere containing flammable or explosive gases.
Fire or an explosion can result.
This product is not designed to be explosion proof.

■If using the product in an interlocking circuit:
•Provide a double interlocking system, for example a mechanical system.
•Check the product regularly for proper operation.
Otherwise malfunction can result, causing an accident.

■The following instructions must be followed during maintenance:
•Turn off the power supply.
•Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance.
Otherwise an injury can result.

⚠Caution

■When handling the unit or assembling/replacing units:
•Do not touch the sharp metal parts of the connector or plug for connecting units.
•Take care not to hit your hand when disassembling the unit.
The connecting portions of the unit are firmly joined with seals.
•When joining units, take care not to get fingers caught between units.
An injury can result.

■After maintenance is complete, perform appropriate functional inspections.
Stop operation if the equipment does not function properly.
Safety cannot be assured in the case of unexpected malfunction.

■Provide grounding to assure noise resistance of the Fieldbus system.
Individual grounding should be provided close to the product with a short cable.

Precautions for Handling

○Follow the instructions given below for selecting and handling.

●The instructions on design and selection

□Product specifications

•Use within the specified voltage.
Otherwise, failure or malfunction can result.

•Reserve a space for maintenance.
Design the system to allow the required space for maintenance.

•Do not remove the label.
This can lead to incorrect maintenance, or misreading of the operation manual, which can cause damage or malfunction to the product.
It may also result in nonconformity to safety standards.

•Beware of inrush current when the power supply is turned on.
An initial charge current may activate the over current protection function depending on the connected load, resulting in the unit malfunctioning.

●Product Handling

□Mounting

•Do not drop, hit or apply excessive shock to the product.
Otherwise damage to the internal parts can result, causing malfunction.

•Tighten to the specified tightening torque.
If the tightening torque is exceeded, the mounting screws can be broken.
If the screws are tightened to a different torque, IP67 will not be achieved.

•Never mount the product in a location that will be used as a foothold.
The product may be damaged if excessive force is applied by stepping or climbing onto it.

□Wiring (Including connecting/disconnecting of the connectors)

•Avoid bending or stretching the cables repeatedly, or placing a heavy load or apply force to the product.
Applying repeated bending and tensile stress to the cable may cause broken wires.

•Wire correctly.
Incorrect wiring may cause malfunction of or damage to the wireless system.

•Do not perform wiring while the power is on.
Otherwise the wireless system may be damaged or malfunction.

•Do not route wires and cables together with power or high voltage cables.
The product can malfunction due to interference of noise and surge voltage from power and high voltage cables close to the signal line.
Route the wires of the wireless system separately from power or high voltage cables.

•Confirm correct insulation of wiring.
Poor insulation (interference with other circuits, poor insulation between terminals, etc.) can apply excessive voltage or current to the wireless system causing damage to it.

•When a wireless system is installed in machinery/equipment, provide adequate protection against noise by using noise filters, etc.
Noise in signal lines may cause malfunction.

□Operating environment

•Select the correct type of enclosure according to the operating environment.
IP67 protection class is achieved when the following conditions are met.
(1) The units are connected correctly using power supply cables and communication cables with M12 (or M8) connectors.
(2) Suitable mounting of each unit and manifold valve.
(3) Be sure to fit a water resistant cap on any unused connectors.
If using in an environment that is exposed to water splashes, please take protective measures, such as using a cover.
Do not use in an atmosphere having water, water steam, or where there is direct contact with any of these. These may cause failure or malfunction.

•Do not use the product in a place where the product could be splashed by oil or chemicals.
Operating in environments with coolants, cleaning solvents, various oils or chemicals may cause adverse effects (failure, malfunction) to the unit even in a short period of time.

•Do not use the product in an environment where corrosive gases or fluids can be splashed.
Otherwise damage to the unit can result, causing malfunction.

•Do not use in an area where surges are generated.
If there is equipment generating large surge near the unit (magnetic type lifter, high frequency inductive furnace, welding machine, motor, etc.), this can cause deterioration of the internal circuitry element of the unit or result in damage. Take measures against the surge sources, and prevent the lines from coming into close contact.

•When a surge-generating load such as a relay, valve, or lamp is directly driven, use the product with built in surge protection.
Direct drive of a load generating surge voltage can damage the unit.

•The product is CE marked, but is not immune to lightning strikes. Take measures against lightning strikes in the system.

•Prevent foreign matter such as dust or wire debris from entering inside the product.
Otherwise it can cause damage or malfunction.

•Mount the product in a place that is not exposed to vibration or impact.
Otherwise it can cause damage or malfunction.

•Do not use the product in an environment that is exposed to temperature cycles.
Heat cycles other than ordinary changes in temperature can adversely affect the inside of the product.

•Do not expose the product to direct sunlight.
If using in a location directly exposed to sunlight, shade the product from the sunlight.
Otherwise it can cause damage or malfunction.

•Keep within the specified ambient temperature range.
Otherwise malfunction can result.

•Do not operate close to a heat source, or in a location exposed to radiant heat.
Otherwise malfunction can result.

□Adjustment and Operation

•Perform settings suitable for the operating conditions.
Incorrect setting can cause operation failure.
(Refer to "Setting and Adjustment".)

•Please refer to the PLC manufacturer's manual, etc. for details of PLC-side programming and addresses.
For the PLC protocol and programming, refer to the relevant manufacturer's documentation.

□Maintenance

•Turn off the power supply, stop the supplied air, exhaust the residual pressure and verify the release of air, before performing maintenance.
Otherwise safety is not assured due to an unexpected malfunction or incorrect operation.

•Perform regular maintenance and inspections.
There is a risk of unexpected operation due to malfunction of the equipment.

•After maintenance is complete, perform appropriate functional inspections.
Stop operation if the equipment does not function correctly.
Otherwise safety cannot be assured due to an unexpected malfunction or incorrect operation.

•Do not use solvents such as benzene, thinner, etc. to clean each unit.
These can damage the surface of the body and erase the markings on the product.
Use a soft cloth to remove stains.
For heavy stains, use a damp cloth that has been soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

Important Instructions concerning the Wireless System

●This product should be used with wireless adapter (EXW1-A11*).
Attach the wireless adapter (EXW1-A11*) directly or attach the wireless adapter (EXW1-A11) together with the cable (EXW1-AC*) for use.

●The wireless adapter (EXW1-A11*) and the wireless remote (EXW1-RD*) are certified as wireless equipment in accordance with the Radio Act and the certification of construction type has been obtained. Customers do not need to apply for a license to use this equipment.
Be sure to comply with the following precautions.
•Do not disassemble or modify the product. Disassembly and modification are prohibited by law.
•This product is compliant with the Radio Act in Japan, European countries and the US. For the latest information, refer to the catalog on the website below.
URL https://www.smcworld.com

●This product communicates using radio waves, and the communication may be temporarily interrupted due to the ambient environments and operating methods. SMC will not be responsible for any secondary failure which may cause an accident or cause damage to other devices or equipment.

●When several units are installed close to each other, the wireless products may interfere with each other, resulting in communication error and response delays.

●Radio waves emitted by this product may adversely affect implantable medical devices such as implantable cardiac pacemakers and defibrillators.
For precautions regarding the use of equipment or devices that may adversely affect performance, refer to the catalog or instruction manuals for the equipment or devices, or contact the manufacturers directly.

●Communication performance is affected by the surrounding environment.

Fieldbus System/ Industrial IoT Cybersecurity

In recent years, factories have introduced industrial IoT, building up complex networks of production machines. These systems may be subject to a new threat, cyberattack. To protect the industrial IoT from cyberattacks, it is important to take multiple measures (multi-layer protection) for IoT devices, networks and clouds.
For this purpose, SMC recommends that the following measures are always taken into consideration. For further details of the following measures, please see security information published by your local country security agencies.

1. Do not connect the devices via a public network.
- If you unavoidably need to access the device or cloud via a public network, ensure to use a secure, private network such as VPN.
- Do not connect an office IT network and factory IoT network.

2. Build a firewall to prevent a threat from entering the device and system.
- Set up a router or firewall at network boundaries to allow minimum required communications.
- Disconnect from the network or turn off the device if no continuous connection is required.

3. Physically block an access to unused communication ports or disable them.
- Inspect regularly each port if any unnecessary device is connected to the network system.
- Operate necessary services (SSH, FTP, SFTP, etc.) only.
- Set a transmission range of the device using a wireless LAN or other radio system to the minimum required and use only devices approved according to the radio act in the country concerned.
- Install a device generating radio waves in such place as there is no interference from indoor or outdoor.

4. Set up a secure communication method such as data encryption.
- Encrypt data in every environment, including IoT networks, secure gate-way connections, for secure communications.

5. Grant access permissions by user accounts and limit the number of users.
- Regularly review accounts and delete all unused accounts or permissions.
- Establish an account lockout system to block an access to the account for a certain period if log-in fails more than the given threshold.

6. Protect passwords.
- Change the default password when you first use the device or system.
- Choose a long password (minimum 8 characters) using a mix of different letters and characters to make the password more secure and harder to hack.

7. Use the latest security software.
- Install antivirus software on all computers to detect and remove viruses.
- Keep the antivirus software up to date.

8. Use the latest version of the device and system software.
- Apply patches to keep the OS and applications up to date.

9. Monitor and detect abnormalities in the network.
- Keep monitoring the network for any abnormalities to take a prompt measure and issue an alert if any abnormality is detected. Install an intrusion detection system (IDS) and intrusion prevention system (IPS).

10. Delete data from devices when disposed of.
- Before disposing of any IoT devices, delete stored data or physically destruct media to prevent any misuse of the data.

SMC Wireless System

Features and Summary

The SMC Wireless System is a wireless-enabled distributed I/O system.
The system consists of a combination of a base unit and remote units, each equipped with communication capabilities for interfacing with higher-level devices (such as PLCs) and wireless communication capabilities.

From an upper-level (PLC) control component, a Base appears to be a single system including Remotes paired with it. For the number of input/output points per system, refer to the manual of each base.

Each Base and Remote is identified by a unique PID(Product ID) registered during pairing, allowing multiple systems to operate in the same area without communication conflicts.
The wireless packets used to transmit and receive data are encrypted.
It is therefore difficult to manipulate the data.

Related Documents

No.	Document No.	Description	Comment
1	EX##-OMA1031	OM for EXW1-BECAC	Available for downloading from SMC world website. URL: https://www.smcworld.com
2	DOC1069997	OM for EXW1-BENAC1	
3	DOC1069999	OM for EXW1-BPNAC1	
4	DOC1089623	OM for EXW1-BDNAC	
5	EX##-OMZ0016	OM for EXW1-BMJA#	
6	DOC1145638	OM for EXW1-BMTAC	
7	EX##-OMV0017	OM for IO Configurator (NFC version)	
8	DOC1037655	OM for EXW1-A1*	

● Caution

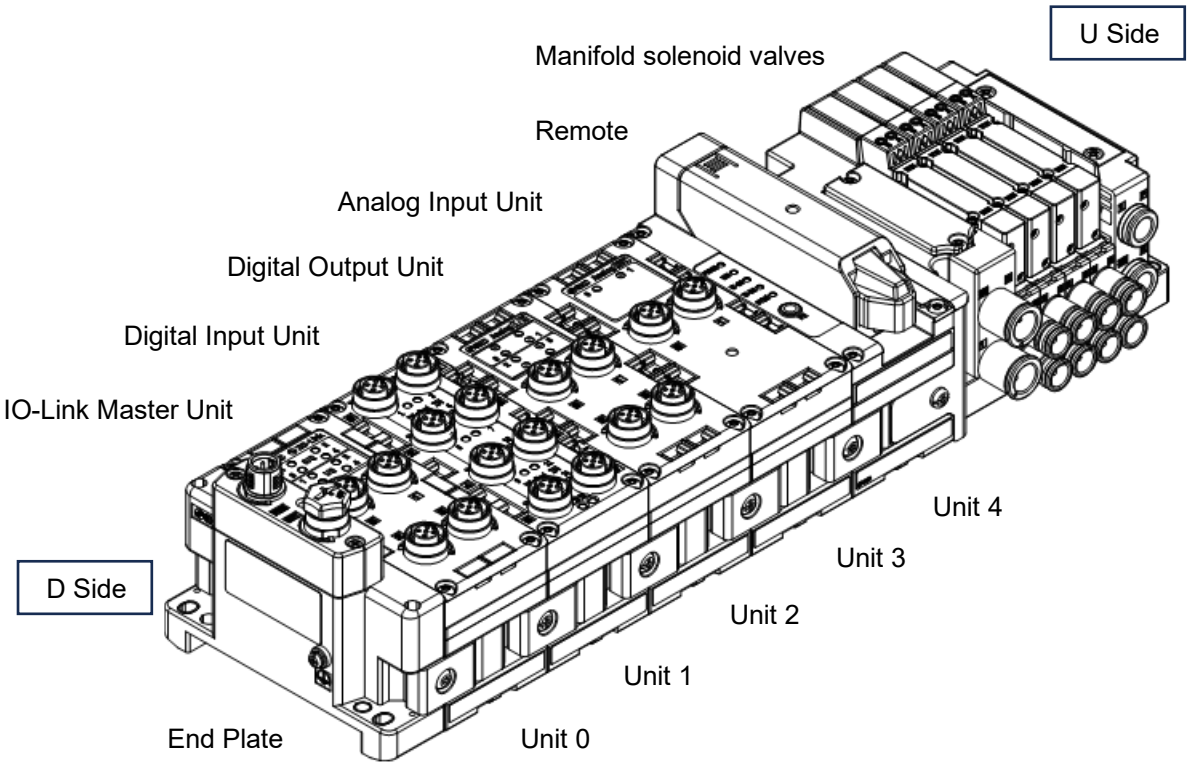
EXW1-BMJA* can only change the unit parameters using the IO Configurator (NFC version).

When paired with the EXA1 series, the device operates in factory default mode and parameter changes are not possible.

Overview of the Remote Modular Type

Remote Overview

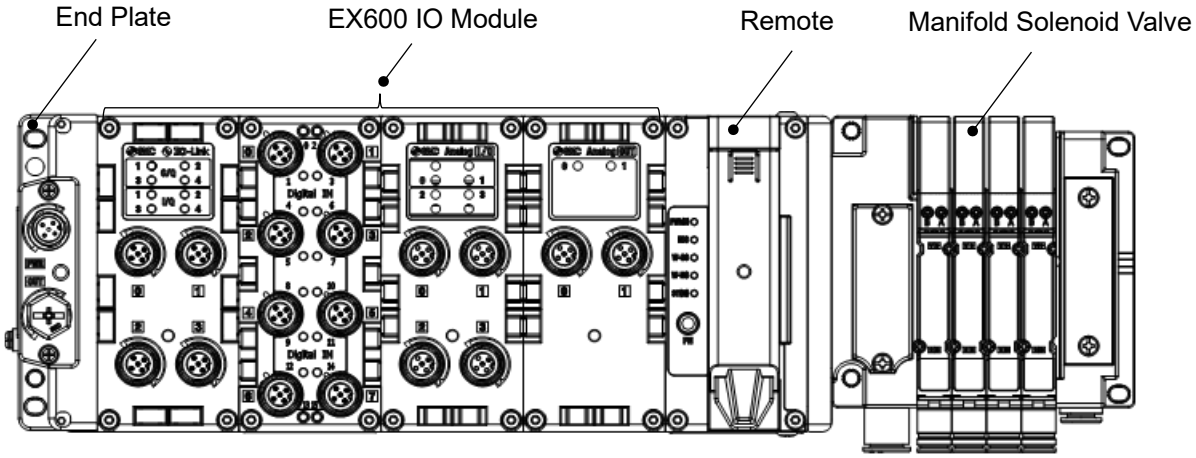
This wireless remote pairs with a base unit compatible with various fieldbus communication protocols, enabling reduced wiring and distributed installation of input devices, output devices, or IO-Link master devices.
Communication with the fieldbus is handled by the wireless base unit.
Up to 32 manifold solenoid valve points can be connected to a single remote unit.
In addition, up to 10 digital units, analog units, and IO-Link units including wireless remote units can be connected in any order.
The number of IO modules that can be connected varies depending on conditions.
For details, refer to “Number of EX600 IO Modules That Can Be Connected” (page197).



Name	Description
Wireless Remote	Handles wireless communication with the wireless base and the ON/OFF output of the manifold solenoid valve.
Digital Input Unit	Receives switch outputs from input devices. Available in PNP and NPN types.
Digital Output Unit	Drives solenoid valves, lamps, buzzers, and other devices. Available in PNP and NPN types.
Digital Input/Output Unit	A unit that combines both digital input and output functions. Available in PNP and NPN types.
Analog Input Unit	Can be connected to sensors and other devices that output analog signals.
Analog Output Unit	Can be connected to devices that accept analog signals.
Analog Input/Output Unit	A unit that supports both analog input and output functions.
IO-Link Master Unit	Can be connected to IO-Link devices. Available in Class A and Class B port types.
End Plate	Connects to the D side of the manifold. Connects the power cable.
Manifold Solenoid Valve	An assembly of solenoid valves. Electrical connections are centralized and connected to a single connector.

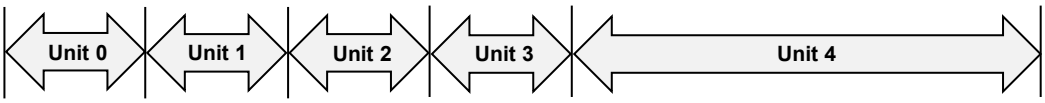
Modular Configuration

The remote configuration is shown below.

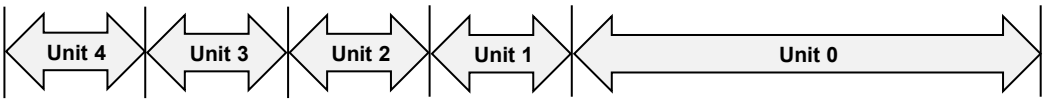


Allocation Direction

・Mode 1



・Mode 2



Example of a Remote Modular Configuration

With the remote unit at the center, the "EX600 IO Module" can be connected on the left and the "Valve Manifold" on the right. You can also use a configuration consisting solely of the EX600 IO Module without connecting the Valve Manifold.

In the wireless system, you can change the direction in which addresses (Unit No.) are assigned to the “EX600 IO Module” and “Valve Manifold” connected to the remote unit.

Mode 1: Assignment proceeds to the right from the EX600 end plate
Mode 2: Assignment from the remote side to the left

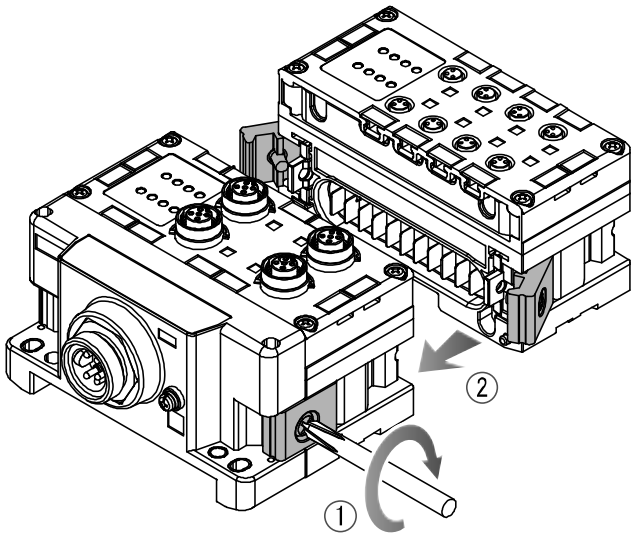
Please note that the IO assignment order in the IO map varies depending on the assignment direction setting.
For details, refer to the IO Map. (page200).

Assembly

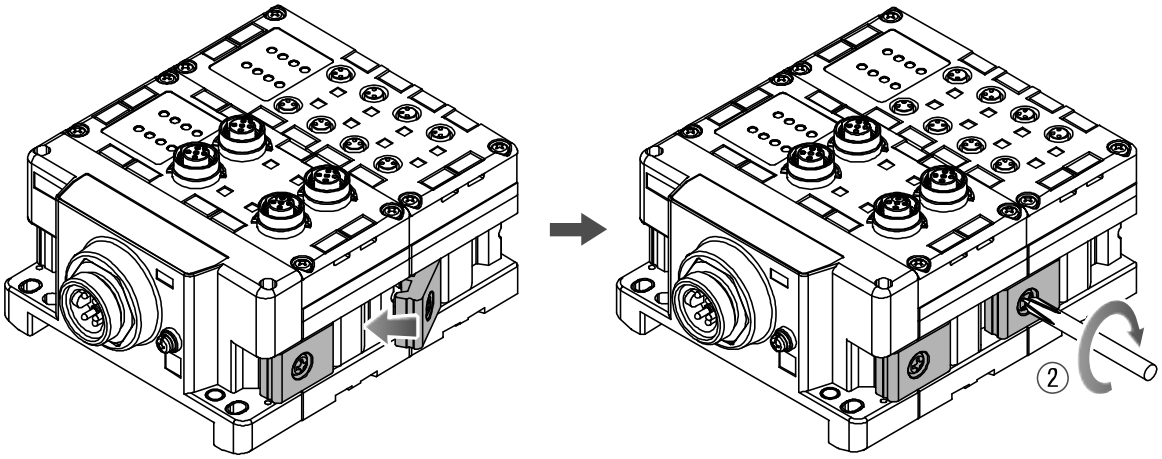
Converting the Unit to a Manifold Configuration

*: If you purchased a unit that has already been configured as a manifold, assembly is not required.

(1) Connect the unit to the end plate.
Digital units, analog units, and IO-Link units can be connected in any order.
Tighten to a torque of 1.5 to 1.6 N·m.



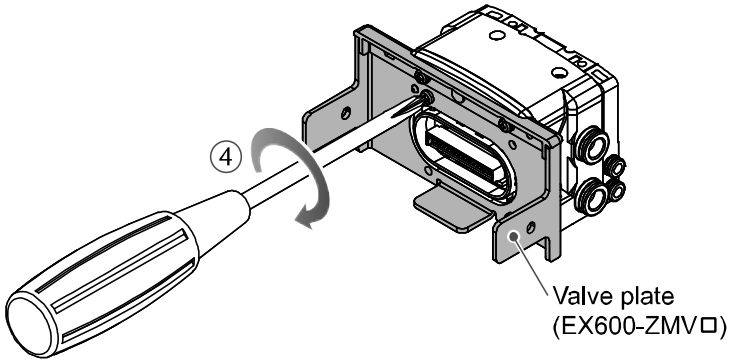
(2) Add more units.
Up to 10 units (including remote units) can be connected to a single manifold.



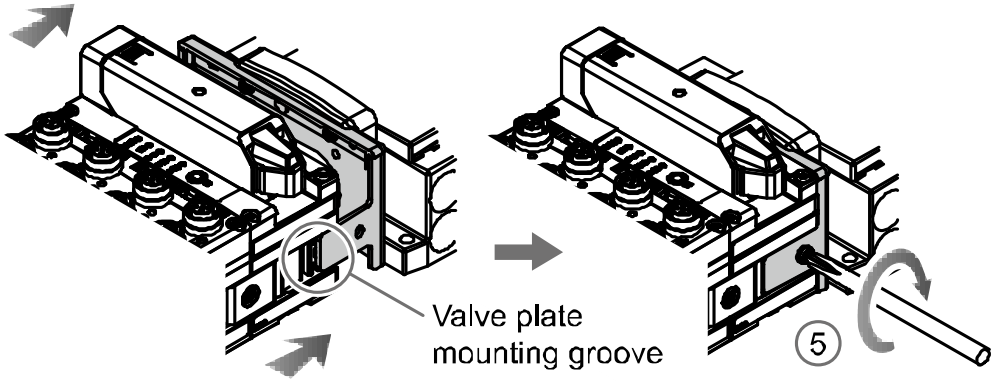
(3) Connecting the Remote
After connecting the necessary units, connect the remote.
Connecting method is the same as above (1), (2).

(4) Installing the Valve Plate
Mount the valve plate (EX600-ZMV#) to the valve manifold using the valve set screws. (M3 x 8 mm)
(Tightening torque: 0.6 to 0.7 N•m)

Screw locations
SV : 2 locations
S0700: 2 locations
VQC1000: 2 locations
VQC2000: 3 locations
VQC4000: 4 locations
SY : 2 locations
JSY : 2 locations

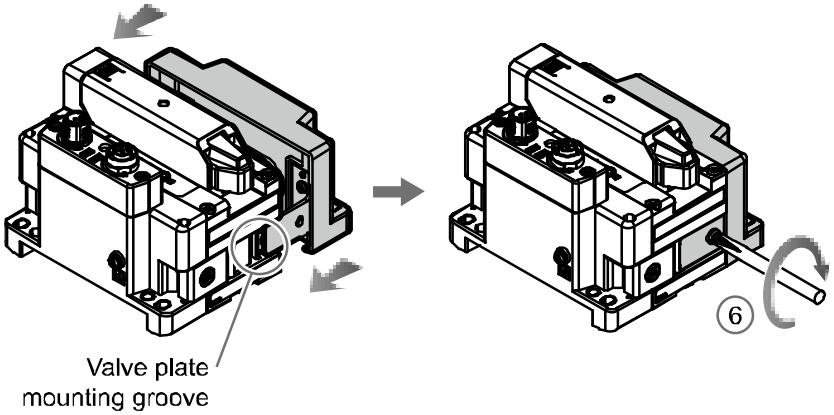


(5) Connect the remote unit and the valve manifold.
Insert the valve plate to the valve plate set groove on the side of the remote unit. Then, tighten it with the valve plate set screws (M4 x 6 mm) to fix the plate.
(Tightening torque: 0.7 to 0.8 N•m)



(6) If the valve manifold is not connected

Insert the end plate (EX600-EU1) into the groove for mounting the valve plate on the remote side, and secure it by tightening the plate mounting screws (M4×6) at two points on each side.
Tighten to a torque of 0.7 to 0.8 Nm.



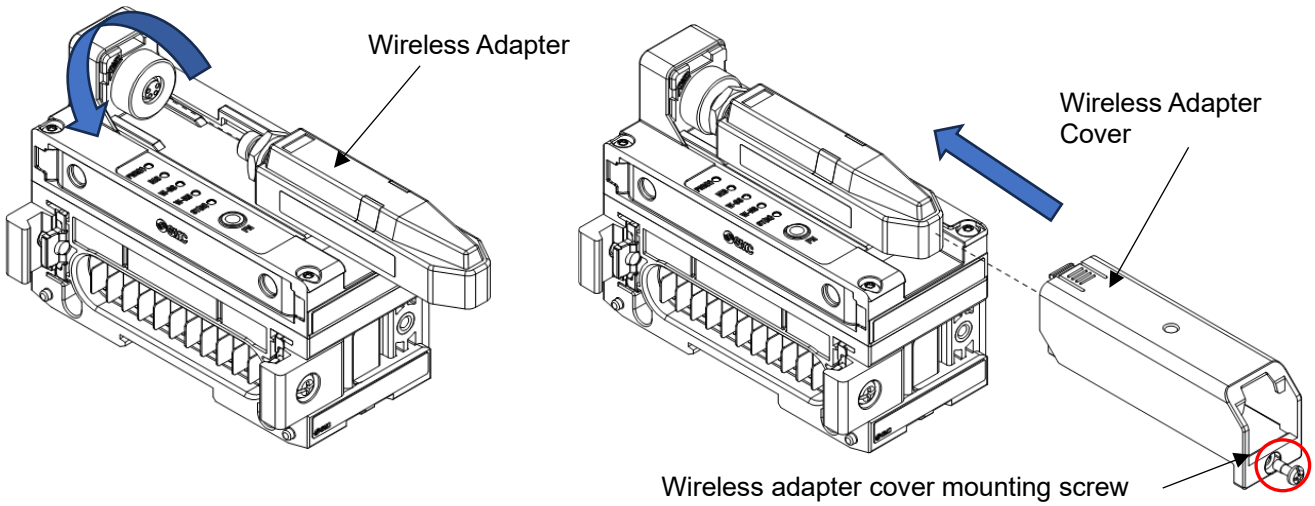
●Handling Precautions

- Do not connect the unit while the power is on.
- Be careful not to let the nuts on the joint fittings fall off.
- Be sure to tighten the screws to the specified torque.
  If the screws are loose, the unit may not operate properly.

Wireless Adapter Installation (Direct Mount) ⚠ Caution

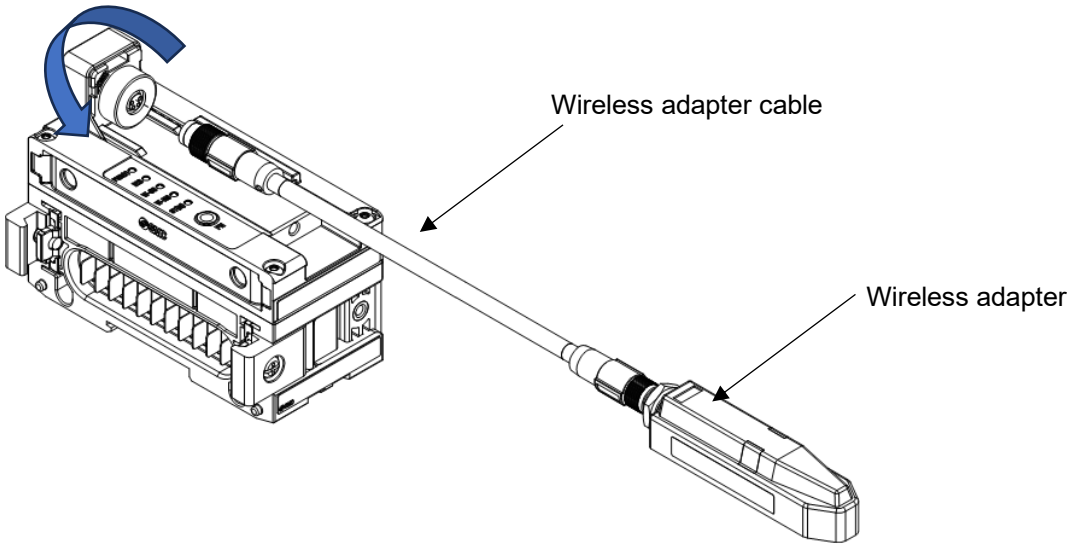
1. Connect the wireless adapter to the main unit.
   screws.

2. Attach the wireless adapter cover and secure it with
   The recommended torque is 0.3 to 0.4 N·m.



Wireless Adapter Installation (Cable Installation) ⚠ Caution

Connect the wireless adapter cable to the main unit and the wireless adapter.



● Handling Instructions

・When mounting the wireless adapter directly, be sure to install the wireless adapter cover before use.

Installation

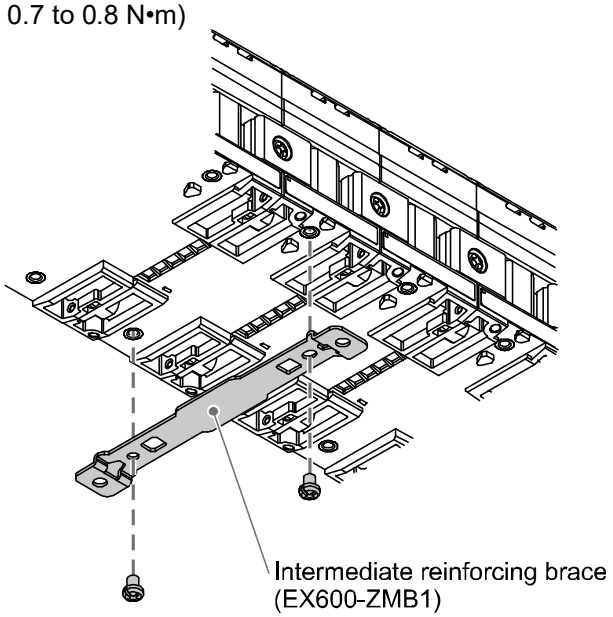
Installation Method

・Direct Mounting

(1) Direct mounting

When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB1) before mounting using 2-M4 x 5 mm screws.

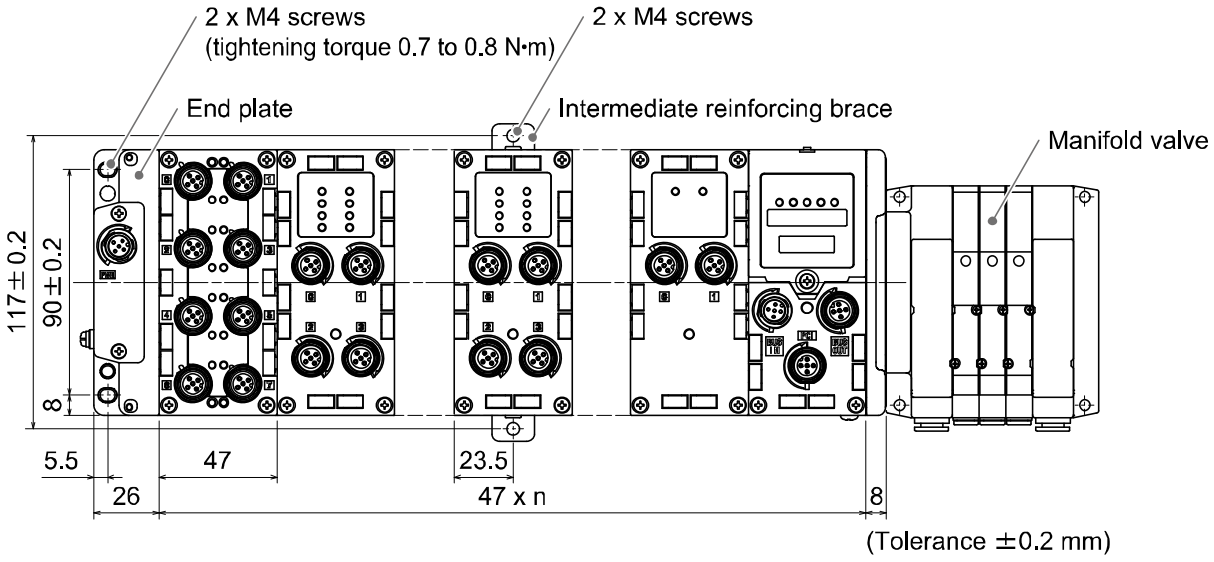
(Tightening torque: 0.7 to 0.8 N•m)



(2) Fix and tighten the end plate at one end of the unit. (M4)

(Tightening torque: 0.7 to 0.8 N•m)

Fix the end plate at the valve side while referring to the operation manual of the corresponding valve manifold.e, refer to the instruction manual for the corresponding manifold solenoid valve when securing it.



n (number of units connected) ≤ 10

● Handling Instructions

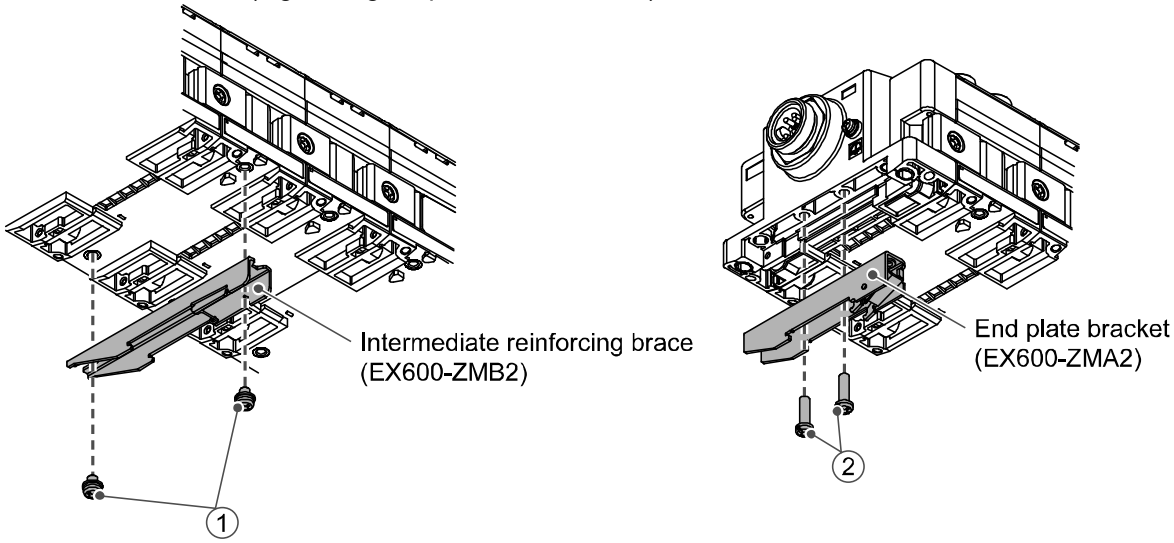
・To prevent connection failures between units due to deflection, install intermediate reinforcement brackets when connecting six or more units in series.

・DIN rail mounting

(Compatible with models other than the SY Series; for the SY Series, please refer to the catalog, etc.)

(1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB2) before mounting, using 2-M4 x 6 mm screws. (Tightening torque: 0.7 to 0.8 N•m)

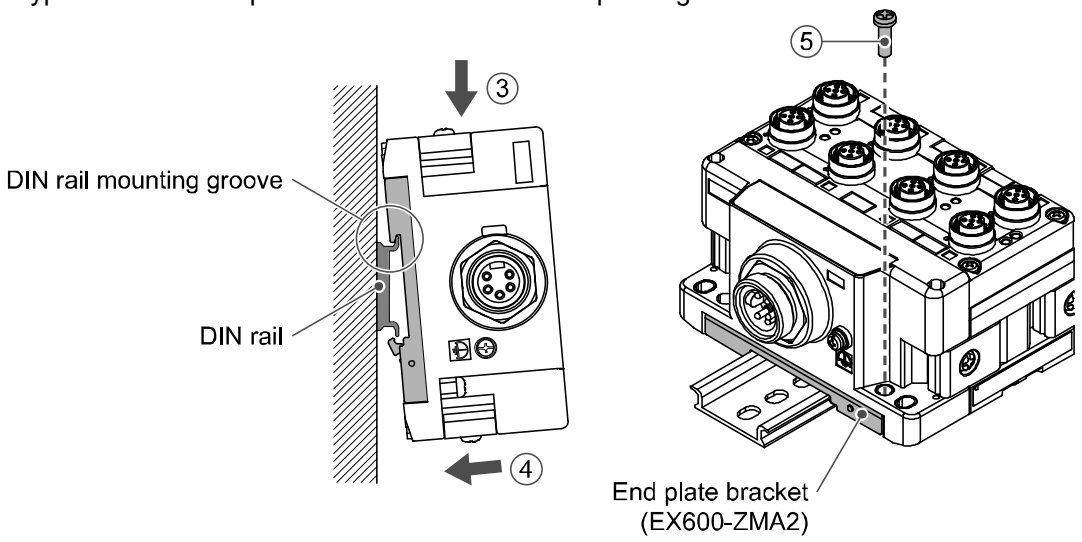
(2) Mount the end plate bracket (EX600-ZMA2) to the end plate at the opposite end to the valves, using 2-M4 x 14 mm screws. (Tightening torque: 0.7 to 0.8 N•m)



(3) Hook the DIN rail mounting groove to the DIN rail.

(4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked.

(5) Fix the manifold by tightening the DIN rail fixing screws of the EX600-ZMA2. (M4 x 20 mm) (Tightening torque: 0.7 to 0.8 N•m) The tightening torque at the valve side depends on the valve type. Refer to the operation manual of the corresponding valve manifold.



● Handling Instructions

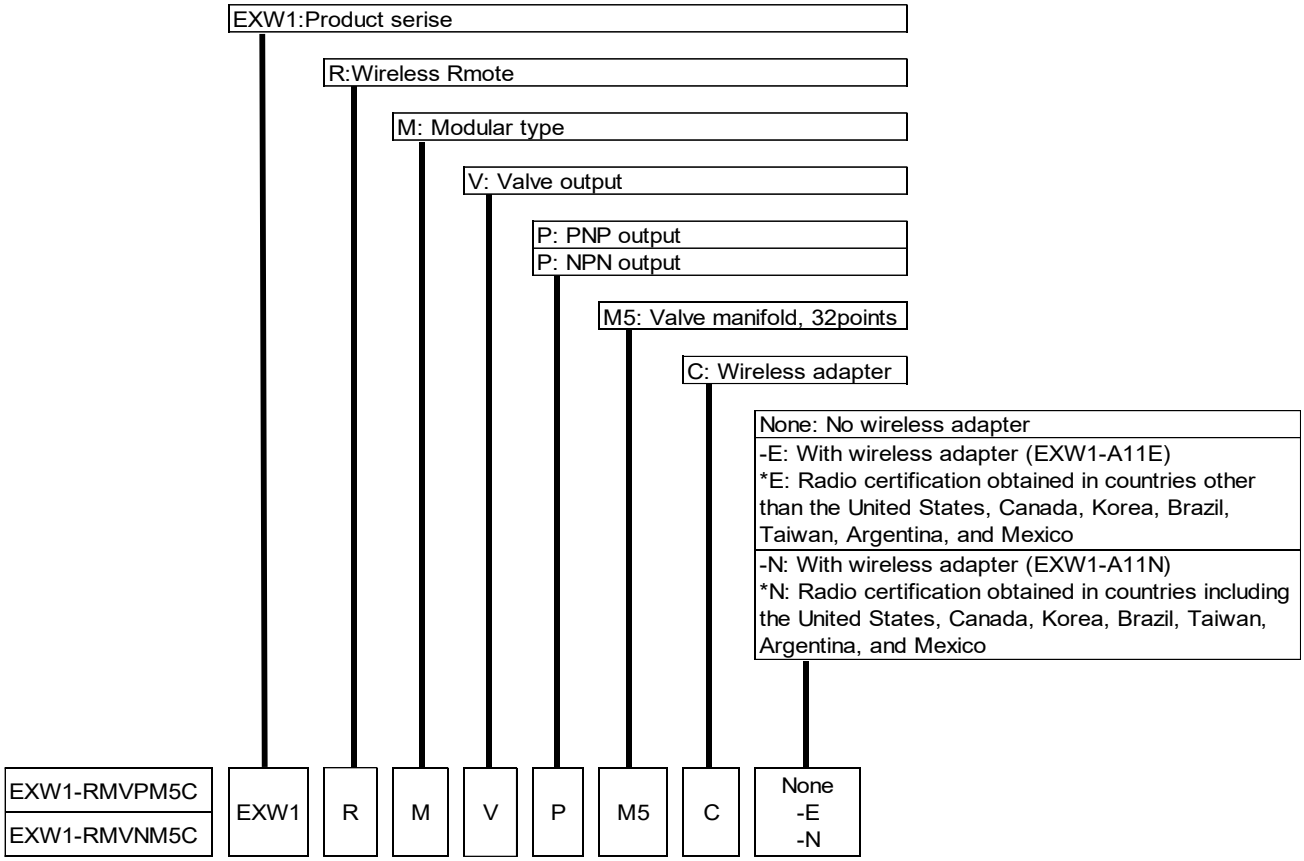
・To prevent connection failures between units due to deflection, install intermediate reinforcement brackets when connecting six or more units in series.

How to Order

The model number is indicated as follows.

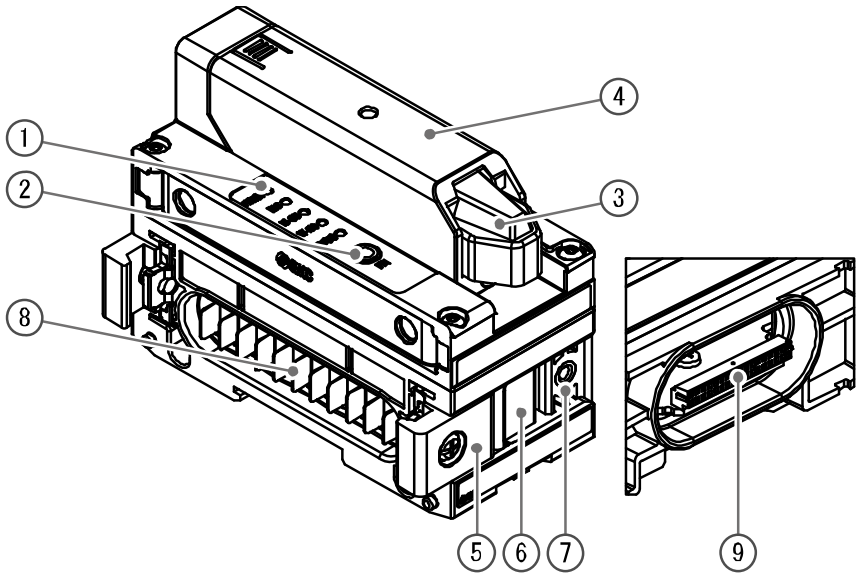
<Wireless Remote>
The lineup consists of two models: EXW1-RMVPM5C, EXW1-RMVNM5C .
The two models listed above are remote controls for a wireless system used in conjunction with a wireless adapter.
When using these units, please procure the wireless adapter and wireless adapter cable, or the wireless adapter and wireless adapter cover, separately.

If the model number ends with [-E] or [-N], the remote control, wireless adapter, and wireless adapter cover are integrated into a single unit.



Summary of Product parts

EXW1-RMV*M5C-*

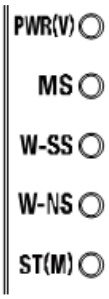


No	Name	Purpose
1	Status Indicator LED	Displays the remote's status.
2	FN (Pairing Button)	Used to enter pairing mode.
3	Wireless Adapter	Handles wireless communication. (Shipped pre-installed when the model with a wireless adapter is selected)
4	Wireless Adapter Cover	Secures the wireless adapter. (Shipped pre-installed when the wireless adapter option is selected)
5	Joint Bracket	Connects modules together.
6	Groove for valve plate mounting	Insert the valve plate here.
7	Screw holes for mounting the valve plate	Secure the valve plate.
8	Unit connection connector (Plug)	Transmits signals to the adjacent module and supplies power.
9	Valve Connection Connector	Connects to the valve manifold.

*: When installing the wireless adapter directly, be sure to install the wireless adapter cover.

LED indicator

The LED indicators display product status. (power supply status, communication status, diagnostic status, etc.)



Wireless Remote Status LED Indicator

・During Normal Operation(During Wireless Protocol V.2.0 operation)

LED Name	Function	LED Status		Description
		Color	ON/OFF Flashing	
PWR (V)	US2 (Output) Power Status Display	Green	ON	US2(Output) power is ON.
		Green	Flashing (1Hz)	US2(Output) power supply voltage drop. (when voltage monitoring is enabled)
		-	OFF	・US2(Output) power supply voltage drop. (when voltage monitoring is disabled) ・US1(Control and Input) power supply is OFF.
MS	Remote Status Indication	Green	ON	Operating normally.
		Green	Flashing (1Hz)	US1(Control and Input) Power Supply Voltage Drop. (When Voltage Monitoring is enabled)
		Red	Flashing (1Hz)	Recoverable fault detected. (Flashes when one or more diagnostic messages are detected) ・Excessive I/O setting inputs/outputs. ・Module connection error. ・Inter-module communication error. ・Diagnostic information detected on the EX600 I/O module. ・Internal communication error between wireless adapters (in use)
		Red	ON	Unrecoverable error.
		Orange	Flashing	Wireless adapter not connected . (when power is turned on)
		-	OFF	US1(Control and Input) power is OFF.
W-SS	Received Signal Strength Indicator	Green	ON	Received signal power level 3.
		Green	Flashing (1Hz)	Received signal power level 2.
		Green	Flashing (2Hz)	Received signal power level 1.
		Orange	Flashing (1Hz)	Wireless Protocol V.2.0 base not connected.
		-	OFF	・US1(Control and Input) power is OFF. ・Base not registered.

・During Normal Operation(During Wireless Protocol V.2.0 operation) (continued)

LED Name	Function	LED Status		Description
		Color	ON/OFF Flashing	
W-NS	Wireless Connection Status Indicator	Green	ON	Connection to base is normal.
		Red	Flashing (1Hz)	Not connected to the base.
		Red	ON	Base not connected. (Irrecoverable wireless communication error)
		Red / Green	Alternating flashes	Configuring wireless connection. (pairing mode)
		Orange	ON	Forced output mode.
		-	OFF	・US1 (Control and Input) power is OFF. ・Base not registered.
ST(M)	Remote Configuration Status Display	Red	Flashing	A discrepancy has occurred with the configuration saved during pairing.
		-	OFF	・No differences from the saved configuration. ・Configuration memory function not in use.

・During Normal Operation(During Wireless Protocol V1.0 operation)

LED Name	Function	LED Status		Description
		Color	ON/OFF Flashing	
PWR (V)	US2 (Output) Power Status Display	Green	ON	US2(Output) power is ON.
		Red	Flashing (1Hz)	US2(Output) power supply voltage drop. (when voltage monitoring is enabled)
		-	OFF	・US2(Output) power supply voltage drop. (when voltage monitoring is disabled) ・US1(Control and Input) power supply is OFF.
MS	Remote Status Indication	Green	ON	Operating normally.
		Red	Flashing (1Hz)	Recoverable fault detected. (Flashes when one or more diagnostic messages are detected) ・US1(Control and Input) Power Supply Voltage Drop. (When Voltage Monitoring is enabled) ・Excessive I/O setting inputs/outputs ・Module connection error. ・Inter-module communication error. ・Diagnostic information detected on the EX600 I/O module. ・Internal communication error between wireless adapters (in use)
		Red	ON	Unrecoverable error.
		Orange	Flashing	Wireless adapter not connected . (when power is turned on)
		-	OFF	US1(Control and Input) power is OFF.
W-SS	Received Signal Strength Indicator	Green	ON	Received signal power level 3.
		Green	Flashing (1Hz)	Received signal power level 2.
		Green	Flashing (2Hz)	Received signal power level 1.
		Red	Flashing (1Hz)	Wireless Protocol V.1.0 base not connected.
		-	OFF	・US1(Control and Input) power is OFF. ・Base not registered.
W-NS	Wireless Connection Status Indicator	Green	ON	Connection to base is normal.
		Red	Flashing (1Hz)	Not connected to the base.
		Red	ON	Base not connected. (Irrecoverable wireless communication error)
		Red / Green	Alternating flashes	Configuring wireless connection. (pairing mode)
		Orange	ON	Forced output mode.
		-	OFF	・US1 (Control and Input) power is OFF. ・Base not registered.
ST(M)	Remote Configuration Status Display	-	OFF	Configuration memory function not in use.

・In pairing mode

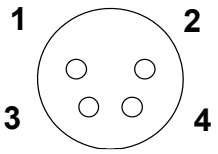
LED Name	Function	LED Status		Description	
		Color	ON/OFF Flashing		
PWR (V)	US2(Output) Power Status Display	Green	ON	US2(Output) power is ON.	
		Green	Flashing (1Hz)	US2(Output) power supply voltage drop. (when voltage monitoring is enabled) **When using Wireless Protocol V.2.0** *1	
		Red	Flashing (1Hz)	US2(Output) power supply voltage drop. (when voltage monitoring is enabled) **When using Wireless Protocol V.1.0** *1	
		-	OFF	・Low US2(Output) power supply voltage. (when voltage monitoring is disabled) ・US1(Control and Input) power supply is OFF.	
MS	Remote Status Indication	Green	ON	Operating normally.	
		Green	Flashing (1Hz)	US1(Control and Input) Power Supply Voltage Drop. (When Voltage Monitoring is enabled) **When using Wireless Protocol V.2.0**	
		Red	Flashing (1Hz)	Recoverable fault detected. (Flashes when one or more diagnostic errors are detected) ・US1(Control and Input) Power Supply Voltage Drop. (When Voltage Monitoring is enabled) **When using Wireless Protocol V.1.0** ・Module connection error. ・Inter-module communication error. ・Internal communication error between wireless adapters (in use)	
		-	OFF	US1(Control and Input) power is OFF.	
W-SS	Received signal strength indicator	Green	ON	Received signal power level 3.	
		Green	Flashing (1Hz)	Received signal power level 2.	
		Green	Flashing (2Hz)	Received signal power level 1.	
		Red	Flashing (1Hz)	Communication with the wireless base has not been established.	
		-	OFF	US1(Control and Input) power is OFF.	
W-NS	Wireless connection status indicator	Red Green	Alternating flashes	Configuring wireless connection. (pairing mode)	
		-	OFF	US1(Control and Input) power is OFF.	
ST(M)	Operating mode Selection Status Indicator *2	Green	ON	IO module assignment direction: **Mode 1**	Configuration memory function: **Disable**
		Red	ON		Configuration memory function: **Enable**
		Orange	ON	IO Module assignment direction: **Mode 2**	Configuration memory function: **Disable**
		-	OFF		Configuration Memory Function: **Enable**

*1: During pairing mode, the low-voltage detection status for the US1 (control an Input) and US2 (output) power supplies is displayed according to the wireless protocol that was active before entering pairing mode.
When a pairing signal is received between the base and the remote, the indication changes to correspond to the wireless protocol setting configured on the base unit.

*2: Configuration memory function settings are applied only when using wireless protocol V.2.0.
When using wireless protocol V.1.0, only the IO module assignment direction is applied.

Connectors

Connector for wireless adapter[*1]

No.	Signal	Description	M8, 4-pin, socket
1	24VDC (US1)	24VDC (US1): Output[*2]	
2	Internal BUS B	Communication B	
3	0VDC (US1)	0VDC (US1)	
4	Internal BUS A	Communication A	

*1: Except the wireless adapter direct mount, use the wireless adapter cable specified to connect to the wireless adapter.
*2: Do not input the power supply.

Power Supply Connector

The system is operated using power supplied from the EX600-ED# end plate.

Setting and Adjustment

Parameters Description

The configuration and diagnostic parameters can be set and verified via upper-level communication from the IO configurator and the paired wireless base.

The configuration and verification methods differ depending on the wireless protocol (V.1.0, V.2.0) and whether the configuration memory function is enabled.
The configuration and verification methods for each unit are shown below.
For details, refer to “Configuration Using the IO Configurator” (page56) and check the communication protocol of the wireless base unit in use.
EtherCAT® : page 79,EtherNet/IP™ : page 99,PROFINET : page 112,DeviceNet® : page 128,
Modbus TCP / SLMP : page 141

・Wireless Protocol V.1.0

Unit Name	Model	Product Part Number		Wireless Protocol V.1.0	
		Unit Name	Parameter	IO Configurator	Host controller (PLC)
Remote	RMV	EXW1-RMV#	Setting	○	×
			Diagnostics	○	×
		DIGITAL OUTPUT (Valve Output)	Setting	○	×
			Diagnostics	○	×
		ON/OFF COUNT	Setting	Not Applicable	
			Diagnostics		
		LOGGER	Setting		
			Diagnostics		
Digital Input Module	DX	EX600-DX##	Setting	○	×
			Diagnostics	○	×
Digital Output Module	DY	EX600-DY##	Setting	○	×
			Diagnostics	○	×
Digital I/O Modules	DM	EX600-DM##	Settings	○	×
			Diagnostics	○	×
Analog Input Module	AX	EX600-AX#	Setting	○	×
			Diagnostics	○	×
Analog Output Module	AY	EX600-AXA	Setting	○	×
			Diagnostics	○	×
Analog I/O Modules	AM	EX600-AM#	Setting	○	×
			Diagnostics	○	×
IO-Link Master Module	LA LB	EX600-LxB1 SIO	Setting	Not Applicable	
			Diagnostics		
		EX600-LxB1 P1–P4	Setting		
			Diagnostics		
		EX600-LxB1 PQI	Settings		
			Diagnostics		

・Wireless Protocol V.2.0

Unit Name	Model	Product Part Number		Wireless Protocol V.2.0			
				Configuration Memory: **"Disable"**		Configuration Memory: **"Enable"**	
		Unit Name	Parameter	IO Configurator	Host controller (PLC)	IO Configurator	Host controller (PLC)
Remote	RMV	EXW1-RMV#	Setting	○	○	○	○
			Diagnostics	○	○	○	○
		DIGITAL OUTPUT (Valve Output)	Setting	○	×	○	○
			Diagnostics	○	×	○	○
		ON/OFF COUNT	Setting	○	×	○	○
			Diagnostics	○	×	○	○
		LOGGER	Setting	None		None	
			Diagnostics	None*1	○	None*1	○
Digital Input Module	DX	EX600-DX##	Setting	○	×	○	×
			Diagnostics	○	×	○	○
Digital Output Module	DY	EX600-DY##	Setting	○	×	○	×
			Diagnostics	○	×	○	○
Digital I/O Module	DM	EX600-DM##	Setting	○	×	○	×
			Diagnostics	○	×	○	○
Analog Input Module	AX	EX600-AX#	Setting	○	×	○	×
			Diagnostics	○	×	○	○
Analog Output Module	AY	EX600-AYA	Setting	○	×	○	×
			Diagnostics	○	×	○	○
Analog Input/Output Module	AM	EX600-AM#	Setting	○	×	○	×
			Diagnostics	○	×	○	○
IO-Link Master Module	LA LB	EX600-LxB1 SIO	Setting	○	×	○	×
			Diagnostics	None		None	
		EX600-LxB1 P1–P4	Setting	○	△*2	○	△*2
			Diagnostics	○	×	○	○
		EX600-LxB1 PQI	Setting	None		None	
			Diagnostics	None		None	

*1: This can be confirmed in the "Viewer" section under System Configuration - Detailed Information on the "Information" tab of the IO Configurator.

*2: Only some configuration parameters are supported.

EXW1-RMV#M5C

<EXW1-RMV# Setting Parameters>

No.	Applicable	Name	Definition	Setting Value	Setting Details	Default Value
1	Remote	Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	Enable	Diagnostic Triggered	○
				Disable	No diagnostic triggered	
2		Brown-out Detection for US2	US2 (for outputs) Power Supply Voltage Drop	Enable	Diagnostic Triggered	
				Disable	No diagnostic triggered	○
3		Output State: Fieldbus Fault Idle *1,*2	Specifies the output state when communication with the host is lost or during Idle mode	Clear	Set output to OFF	○
				Hold	Hold Output	
				Individual	Depends on each unit's settings	
4		Output State for RF Timeout *2	Output settings when wireless communication is lost (timeout)	Clear	Set output to OFF	
				Hold	Hold output	○
				Individual	Depends on each unit's settings	
5		Byte Order of Analog Values *3	Endian Type (Analog only)	Little-Endian	Little-endian	○
				Big-Endian	Big-Endian	
6		AD Update Time *4,*5	Analog Update Time	100–60000	Analog Update Time [ms] (Wireless ProtocolV.2.0)	500
				0.1, 0.2, 0.5, 1 2, 5, 10, 30, 60	Analog Update Time [ms] (Wireless ProtocolV.1.0)	0.5
7		ON/OFF Count Mode *6	Setting the Measurement Target for ON/OFF Time Measurement	Input16ch	Between two input points	○
				Input8ch/Output8ch	Between two input/output points	
8		Valve Output	Number of occupied points on the valve manifold	0 Outputs	0 points	
				8 Outputs	8 points	
				16 Outputs	16 points	
				24 Outputs	24 points	
				32 Outputs	32 points	○

*1: This function is available only when the "Output State Fieldbus Fault Idle" setting of the wireless base is set to "Individual"

*2: When set to "Individual," the parameters of each module connected to the remote are applied.

*3: Applies only to process data from analog units of the EX600 series connected to the remote unit.

*4: The setting values vary depending on the wireless protocol version.

*5: This applies to the process data from the analog inputs and IO-Link master inputs of the EX600 IO modules connected to the remote.

*6: ON/OFF Count Mode is a feature exclusive to wireless protocol V.2.0.

The following are parameters that are set when pairing with the base unit.

<EXW1-RMV# Other Parameters>

No.	Applicable	Name	Definition	Setting Value	Setting Details	Default Value
1	Remote	Input Size *1	Sets the number of input points that the remote can control.	0-160byte	Can be set in 2byte units (Wireless Protocol V.2.0)	Auto *2
				0-16byte	Can be set in 2byte units (Wireless Protocol V.1.0)	16byte
2		Output Size *1	Sets the number of output points that the remote can control.	0-160byte	Can be set in 2byte units (Wireless Protocol V.2.0)	Auto *2
				0-16byte	Can be set in 2byte units (Wireless Protocol V.1.0)	16byte
3		Unit Address Order *3	Defines the address assignment direction of the EX600 IO modules.	Mode1	Assignment proceeds to the right from the end plate side.	○
				Mode2	Assignment proceeds to the left from the wireless unit side.	
4		Configuration Memory Mode *4	Sets whether the configuration memory function is enabled or disabled.	Enable	Configuration memory function enabled	
				Disable	Configuration memory function disabled	○

*1: For details on how to set [Input Size] and [Output Size], please refer to “Input Size / Output Size Settings” (page185).
*2: The number of occupied points of the EX600 IO modules connected to the remote is automatically recognized and set as the default value.
When the occupied size is 16 bytes or less, 16 bytes is used as the default value.
Note that the EX600-L#B (IO-Link master unit) is recognized as Input: 70 bytes and Output: 66 bytes.
P1/P2/P3/P4 Port INPUT IO-Link Size: 16 bytes
P1/P2/P3/P4 Port Output IO-Link Size: 16 bytes
SIO Input: 2 bytes, Output: 2 bytes(Fixed setting; occupancy points are not configurable.)
PQI Input: 4 bytes, Output: 0 bytes (Fixed setting; occupancy points are not configurable.)
If the INPUT/OUTPUT Size of P1/P2/P3/P4 ports is used with occupancy points other than those listed above, please change the occupancy points for each port after pairing.
*3: For details on how to set “Unit Address Order,” please refer to the “How to Pair” (page180).
*4: For details, please refer to the “Configuration Memory Function” (page195).

<EXW1-RMV# Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Remote	Unit Address Order	IO Module Assignment Direction	Mode 1	Assigned from the end plate to the right
				Mode 2	Assigned from the remote to the left
2		Configuration Memory Mode	Configuration Storage Function	Enable	Configuration Memory Function: Enable
				Disable	Configuration Memory Function: Disable

<EXW1-RMV# DIGITAL OUTPUT (Valve Output) Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	Valve Output	Short Circuit Detection (OUTPUT)	An error is generated when a short circuit is detected in the output device	Enable	Diagnostic Trigger	○
				Disable	Diagnostics do not occur	
2		Restart After Short Circuit	Configure settings for resuming operation after a short-circuit error has been cleared.	Enable (Auto)	When the short circuit is cleared, the error is automatically cleared as well	○
				Disable (Manual)	Even if the short circuit is cleared, the error will not be cleared until power is cycled	
3		Ch 7-0: Open Circuit Detection	Detects an open circuit	0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
4		Ch 15-8: Open Circuit Detection		0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8	0x00
5		Ch 23-16: Open Circuit Detection		0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch23 … Ch16	0x00
6		Ch 31-24: Open Circuit Detection		0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch31 … Ch24	0x00
7		Ch 7-0: Hold State for Fieldbus Fault	Configure the operation of Configure the behavior of digital outputs	0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0	0xFF
8		Ch 15-8: Hold State for Fieldbus Fault		0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8	0xFF
9		Ch 23-16: Hold State for Fieldbus Fault		0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch23 … Ch16	0xFF
10		Ch 31-24: Hold State for Fieldbus Fault		0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch31 … Ch24	0xFF
11		Ch 7-0: Output State for Fieldbus Fault *1	When communication with the host is lost Configure the behavior of the digital output value (Hold State for Fieldbus Fault is set to "Individual")	0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0	0x00
12		Ch 15-8: Output State for Fieldbus Fault *1		0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8	0x00
13		Ch 23-16: Output State for Fieldbus Fault *1		0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch23 … Ch16	0x00
14		Ch 31-24: Output State for Fieldbus Fault *1		0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch31 … Ch24	0x00

<EXW1-RMV# DIGITAL OUTPUT (Valve Output) Setting Parameters>(continued)

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
15	Valve Output	Ch 7-0: Hold State for Fieldbus Idle	Configures the behavior of the digital output during upper-level communication Idle and wireless disconnection conditions.	0x00–0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch7 ... Ch0	0xFF
16		Ch 15-8: Hold State for Fieldbus Idle		0x00–0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch15 ... Ch8	0xFF
17		Ch 23-16: Hold State for Fieldbus Idle		0x00–0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch23 ... Ch16	0xFF
18		Ch 31-24: Hold State for Fieldbus Idle		0x00–0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch31 ... Ch24	0xFF
19		Ch 7-0: Output State for Fieldbus Idle *2,*3	Configure the behavior of the digital output value during upper-level communication Idle and wireless disconnection conditions. (Hold State for Fieldbus Idle setting is set to "Individual")	0x00–0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch7 ... Ch0	0x00
20		Ch 15-8: Output State for Fieldbus Idle *2,*3		0x00–0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch15 ... Ch8	0x00
21		Ch 23-16: Output State for Fieldbus Idle *2,*3		0x00–0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch23 ... Ch16	0x00
22		Ch 31-24: Output State for Fieldbus Idle *2,*3		0x00–0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch31 ... Ch24	0x00
23		Ch 7-0: ON/OFF Counter Limit Detection *4	An error is generated when the number of ON/OFF operations of the output device exceeds the set value	0x00-0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch7 ... Ch0	0x00
24		Ch 15–8: ON/OFF Counter Limit Detection *4		0x00–0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch15 ... Ch8	0x00
25		Ch 23–16: ON/OFF Counter Limit Detection *4		0x00–0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch23 ... Ch16	0x00
26		Ch 31-24: ON/OFF Counter Limit Detection *4		0x00–0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch31 ... Ch24	0x00
27		Counter Limit Value (1k–65000k) *5	Setting the number of ON/OFF cycles	1–65,000	Number of operations [times] Set value × 1000	65,000

*1: This function is enabled only when the unit parameter “Hold State for Fieldbus Fault” is set to “Individual.”
*2: This function is enabled only when the unit parameter “Hold State for Fieldbus Idle” is set to “Individual.”
*3: This function may not be available on certain PLC models.
*4: The count value is saved every hour. When the power is turned back on, the count resumes from the last saved value.
*5: The set count is equal to the set value multiplied by 1,000.

<EXW1-RMV# DIGITAL OUTPUT (Valve Output) Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Valve Output	Ch#: ON/OFF Counter Value	ON/OFF Operation Count	0–4294967295 (0 to 0xFFFFFFFF)	Number of ON/OFF cycles per channel
2			ON/OFF Clear operation count	Clear	Sets the ON/OFF operation count to 0
3		Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
4		Ch 15-8: ON/OFF Counter Limit Exceeded		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
5		Ch 23-16: ON/OFF Counter Limit Exceeded		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch23 ... Ch16
6		Ch 31-24: ON/OFF Counter Limit Exceeded		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch31 ... Ch24
7		Ch 7-0: Open Circuit Detection	Detects an open circuit	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
8		Ch 15-8: Open Circuit Detection		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
9		Ch 23-16: Open Circuit Detection		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch23 ... Ch16
10		Ch 31-24: Open Circuit Detection		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch31 ... Ch24
11		Ch 7-0: Short Circuit Detection (OUTPUT)	Detects short circuits in output devices	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
12		Ch 15-8: Short Circuit Detection (OUTPUT)		0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
13		Ch 23-16: Short Circuit Detection (OUTPUT)		0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch23 ... Ch16
14		Ch 31-24: Short Circuit Detection (OUTPUT)		0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch31 ... Ch24

<EXW1-RMV# ON/OFF COUNT Setting Parameter>
The ON/OFF Count function has different setting values depending on whether it is configured via the IO Configurator or host controller(PLC).

・IO Configurator

No.	Target	Name		Definition	Setting Value	Setting Details	Default Value
1	ON/OFF COUNT	Ch #: Measurement start	Ch	Set the channel on which measurement starts and specify the trigger conditions	In_Ch0-15 Out_Ch0–Ch7	Channel selection	-
			Trigger		Rising_Edge Falling_Edge Both Edges	Selecting Trigger Conditions	Falling
2		Ch #: Measurement end	Ch	Set the channel to end measurement and the trigger conditions	In_Ch0-15 Out_Ch0–Ch7	Channel selection	-
			Trigger		Rising_Edge Falling_Edge Both Edges	Selecting Trigger Conditions	Rising
3		Ch #: Detection Value Upper Limit		Upper Threshold Setting	0–65535	Upper Limit [ms]	0
4		Ch #: Detection Value Lower Limit		Lower Threshold Setting	0–65535	Lower Limit [ms]	0
5		Ch #: Notification Set Point		Setting the number of times to notify for measurements outside the threshold	0–65535	Set the number of times to notify for measurements outside the threshold [times]	5

・Host controller(PLC).

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	ON/OFF COUNT	Ch #: Measurement Start	Set the channel to start measurement and the trigger conditions	0x0000-0x2F2F	Measurement Start/End Channels and Trigger Settings (page222)	Page225
2		Channel #: Measurement end	Set the channel to end measurement and the trigger conditions	0x0000-0x2F2F	Measurement Start/End Channels and Trigger Settings (page222)	Page225
3		Channel #: Upper Limit Detection Value	Upper Threshold Setting	0–65535	Upper Limit Setting [ms] (page228)	0
4		Ch #: Lower Limit Detection Value	Lower Threshold Setting	0–65535	Lower Limit Setting [ms] (page228)	0
5		Ch #: Notification set point	Setting the number of times to notify for measurements outside the threshold	0–65535	Setting the number of times to notify for measurements outside the threshold [times] (page228)	5

<EXW1-RMV# ON/OFF COUNT Diagnostics Parameter>

No.	Target	Name	Definition	Setting Value	Setting Details
1	ON/OFF COUNT	Ch 7-0: Exceeded Specified Limit	Detection of Measurement Outside Threshold	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit 7 ... Bit 0 Ch7 ... Ch0
2		Ch 15-8: Exceeded specified limit *1		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit 7 ... Bit 0 Ch15 ... Ch8
3		Latest value	Latest measurement time	0–65535 [ms] *2	Latest value for ON/OFF measurement time (page231)
4		Average value	Average of the last 8 measurements starting from the latest measurement time	0–65535 [ms] *2	The latest value of the ON/OFF measurement time (page231)
5		Maximum value	Maximum value since the start of measurement	0–65535 [ms] *2	Latest value of ON/OFF measurement time (page231)
6		Minimum value	Minimum value since the start of measurement	0–65535 [ms] *2	Latest value of ON/OFF measurement time (page231)
7		Out of range	Number of measurements outside the threshold	0–65,535 [times] *3	Number of measurements outside the threshold (Page231)
8		Total count	Total number of measurements	0–4294967295 [times] *4	Total number of measurements (Page231)
9		Ch #: Clear	Set the latest value, average, maximum, and minimum to 0	Clr (Clear) 0x01	Set the latest value, average value, maximum, and minimum values to 0
10			Set the latest value, average value, maximum value, minimum value, number of measurements outside the threshold, and total number of measurements to 0	All (All clear) 0xFF	Set the timer's latest value, average value, maximum, minimum, number of out-of-threshold measurements, and total number of measurements to 0

*1: The number of channels varies depending on the number of occupied points on the connected input module.
*2: The value is 0 if no measurement has been taken. Retrieves data for all 16 Timer channels at once.
For details, see “Acquired Data (page231).”
*3: This data is retrieved when a threshold is set (non-zero) and a measurement falls outside the threshold.
Retrieves data for all 16 Timer channels at once.
For details, see “Logging and Notification Functions (page226).”
*4: Data for all 16 Timer channels is retrieved in a single batch. For details, see “Acquired Data (page231).”

ON/OFF COUNT is available only with Wireless Protocol V.2.0. For details, see “ON/OFF Time Measurement Function (page221)” and “Log and Notification Functions (page226).

Digital Input Module (EX600-DX#/DM#)

<Digital Input Unit Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	Input Unit	Short Circuit Detection (Power)	Detects short circuits	Enable	Diagnostic Trigger	○
				Disable	No diagnostics triggered	
2		Open circuit detection *1,*2	Detects open circuits Detects	Enable	Diagnostic Trigger	
				Disable	No diagnostics triggered	○
3		Inrush Current Filter	For 100 ms Toggles whether to perform overcurrent detection	Enable	Ignores inrush current	
				Disable	Do not ignore inrush current	○
4		Input Filtering Time	Set the time during which changes in the input signal are ignored	0.1 ms	Input signal filtering time [ms]	
				1.0 ms		○
				10 ms		
				20 ms		
5		Input Hold Time	Select the duration for holding the input signal	1.0 ms	Input signal hold time [ms]	
				15 ms		○
				100 ms		
				200 ms		
6		Ch 7-0: ON/OFF Counter Limit Detection	An error is generated when the number of ON/OFF operations of the input device exceeds the set value *3	0x00-0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch7 ... Ch0	0x00
7		Ch 15-8: ON/OFF Counter Limit Detection		0x00-0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch15 ... Ch8	0x00
8		Ch #: Counter Limit Value (1k–65000k) *4	Sets the ON/OFF count limit.	1-65,000	Number of operations [times] Set value × 1000	65000

*1: Wire break detection is a function exclusive to digital input units with wire break detection (EX600-DXPC1, EX600-DXNC1).

*2: If the input device you are using is a 2-wire type, input devices (such as contact-type sensors) with a leakage current of 0.5 mA or less when OFF will cause false detections.
Please use input devices with a leakage current of 0.5 mA or more when OFF.
If the input device you are using is a 3-wire type, devices with a current consumption of 0.5 mA or less may cause false detections.
Additionally, open circuits in the input signal lines cannot be detected.

*3: The count value is saved every hour.When the power is turned back on, the count resumes from the last saved value.

*4: The set count is equal to the set value multiplied by 1,000.

<Digital Input Unit Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Input Unit	Ch #: ON/OFF Counter Value	ON/OFF Number of Operations	0–4294967295 (0 to 0xFFFFFFFF)	Number of times each channel was turned on/off
2			ON/OFF Clear Operation Count	Clear	Sets the ON/OFF operation count to 0
3		Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
4		Ch 15-8: ON/OFF Counter Limit Exceeded		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
5		Ch 7-0: Short Circuit Detection (Input)	Power Supply Short Circuit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
6		Ch 15-8: Short Circuit Detection (Input)		0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8

Digital Output Module (EX600-DY#/DM#)

<Digital Output Unit Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	Output Unit	Short Circuit Detection (OUTPUT)*1	An error is generated when a short circuit is detected in the output device	Enable	Diagnostic Triggered	○
				Disable	Diagnostics do not occur	
2		Restart After Short Circuit	Configure settings for resuming operation after a short-circuit error has been cleared.	Auto	When the short circuit is cleared, the error is automatically cleared as well	○
				Manual	Even if the short circuit is cleared, the error will not be cleared until power is cycled	
3		Ch 7-0: Open Circuit Detection	Detects an open circuit	0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
4		Ch 15-8: Open Circuit Detection		0x00-0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8	0x00
5		Ch 7-0: Hold State for Fieldbus Fault	Configure the operation of Configure the behavior of the digital output	0x00-0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0	0xFF
6		Ch 15-8: Hold State for Fieldbus Fault		0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8	0xFF
7		Ch 7-0: Output State for Fieldbus Fault *2	When Upper-Level Communication Is Disconnected Configure the digital output behavior (Hold State for Fieldbus Fault setting is set to “Individual”)	0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0	0x00
8		Ch 15-8: Output State for Fieldbus Fault *2		0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8	0x00
9		Ch 7-0: Hold State for Fieldbus Idle	Configures the operation of digital outputs during upper-level communication Idle	0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0	0xFF
10		Ch 15-8: Hold State for Fieldbus Idle		0x00–0xFF	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8	0xFF
11		Ch 7-0: Output State for Fieldbus Idle *3,*4	Configure the behavior of digital outputs during upper-level communication Idle (Hold State for Fieldbus Idle setting is set to "Individual")	0x000xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0	0x00
12		Ch 15-8: Output State for Fieldbus Idle *3,*4		0x00–0xFF	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8	0x00

<Digital Output Unit Setting Parameters>(continued)

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
13	Output Unit	Ch 7-0: ON/OFF Counter Limit Detection *5	An error is generated when the number of ON/OFF operations of the output device exceeds the set value	0x00-0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch7 ... Ch0	0x00
14		Ch 15-8: ON/OFF Counter Limit Detection *5		0x00-0xFF	0: Disable, 1: Enable Bit7 ... Bit0 Ch15 ... Ch0	0x00
15		Counter Limit Value (1k–65000k) *6	Sets the ON/OFF count limit	1–65,000	Number of operations [times] Set value × 1000	65000

*1: If the load you are using (e.g., a lamp load) is falsely detected as a short circuit, disable this setting.
*2: This function is enabled only when the unit parameter “Hold State for Fieldbus Fault” is set to “Individual.”
*3: This function is enabled only when the unit parameter “Hold State for Fieldbus Idle” is set to “Individual.”
*4: This function may not be available on certain PLC models.
*5: The count value is saved every hour. When the power is turned back on, the count resumes from the last saved value.
*6: The set count is equal to the set value multiplied by 1,000.

<Digital Output Unit Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Output Unit	Ch #: ON/OFF Counter Value	ON/OFF Operation Count	0–4294967295 (0 to 0xFFFFFFFF)	Number of ON/OFF cycles per channel
2			ON/OFF Clear operation count	Clear	Sets the ON/OFF operation count to 0
3		Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detected	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
4		Ch 15-8: ON/OFF Counter Limit Exceeded		0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
5		Ch 7-0: Open Circuit Detection	Detects an open circuit	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
6		Ch 15-8: Open Circuit Detection		0x00-0xFF	0: No diagnostics, 1:Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8
7		Ch 7-0: Short Circuit Detection (OUTPUT)	Detects short circuits in output devices	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
8		Ch 15-8: Short Circuit Detection (OUTPUT)		0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch15 ... Ch8

Analog Input Module (EX600-AX#/AM#)

<Analog Input Unit Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	Analog Input Unit	Analog Data Format	Data Format	Offset binary	Offset Binary Format	○
				Signed Magnitude	Signed binary format	
2				2's complement	2's complement format	
				Scaled	Scaled format (AXB only)	
3		Ch#: Analog Range	Sets the range of the analog input device	-10.. +10 V	Select the range. (AXB cannot be set to -10..+10 V or -5.. +5 V/-20.. +20 mA cannot be selected)	○(AXA)
				-5.. +5 V		
				-20.. +20 mA		
				0..10 V		
				0..5 V		
				1.5 V		○(AXB)
				0..20 mA		
				4..20 mA		
4		Ch#: Analog Filter	Set the number of analog filter passes	None	No analog filter	
				2AVG	Average of the last two values	○
				4AVG	Average of the last 4 values	
				8AVG	Average of the last 8 times	
5		Ch7-0: Upper Limit (0x00)	Upper Limit Error Detected Function	0x00–0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
6		Ch#: Upper Limit Value *1	Setting the Upper Limit Value	-32766-32767	Scaled format	1000
				Per range	Other than scaled format	
7		Ch7-0: Lower Limit (0x00)	Lower Limit Error Detection Function	0x00–0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
8		Ch#: Lower Limit Value *1	Setting the Lower Limit Value	-32766-32767	Scaled format	1000
				Per range	Other than scaled format	
9		Short Circuit Detection (Power)	Detects short circuits in the input device's power supply	Enable	Diagnostic Trigger	○(AXA)
				Disable	No diagnostics triggered	○(AXB)
10		Over Range	Upper Range Limit Error Detection Function	Enable	Diagnostic Triggered	○(AXA)
				Disable	Diagnostic not triggered	○(AXB)
11		Under Range	Lower Range Error Detection Function	Enable	Diagnostic Triggered	○(AXA)
				Disable	No diagnostics triggered	○(AXB)

*1: Please set the values within the configurable range for each analog input range. (page40)
When changing the analog input range, be sure to check the setting and adjust it to the appropriate value.

Configurable range of user upper/lower limit values depending on the input range

User-configurable upper and lower limit ranges

Range	Configurable Range			
	EX600-AXA		EX600-AXB	
	Lower limit	Upper Limit	Lower Limit	Upper limit
-10 to +10 V	-10.50 to +10.45 V	-10.45 to +10.50 V	N/A	
-5..+5 V	-5.25 to +5.22 V	-5.22 to +5.25 V		
-20..+20 mA	-21.00 to +20.90 mA	-20.90 to +21.00 mA		
0..10 V	0.00 to +10.45 V	+0.05 to +10.50 V	+0.00 to +10.19 V	+0.05 to +10.24 V
0..5 V	0.00 to +5.22 V	+0.03 to +5.25 V	+0.00 to +5.09 V	+0.03 to +5.12 V
1..5 V	+0.75 to +5.22 V	+0.78 to +5.25 V	+0.75 to +5.09 V	+0.78 to +5.12 V
0..20 mA	0.00 to +20.90 mA	+0.10 to +21.00 mA	+0.00 to +20.90 mA	+0.10 to +21.00 mA
4..20 mA	+3.00 to +20.90 mA	+3.10 to +21.00 mA	+3.00 to +20.90 mA	+3.10 to +21.00 mA

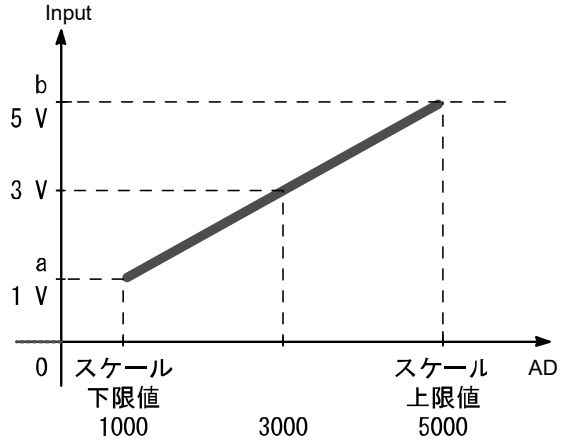
Correspondence Table for Upper and Lower User-Set Limits

Range	EX600-AXA		EX600-AXB	
	Setting	Expected Value	Setpoint	Expected Value
-10..+10 V	0-1050	0.00 to +10.50 V	N/A	N/A
	0 to -1050	0.00 to -10.50 V		
-5..+5 V	0 to 525	0.00 to +5.25 V		
	-0 to -525	0.00 to -5.25 V		
-20..+20 mA	0-2100	0.00 to +21.00 mA		
	-0 to -2100	0.00 to -21.00 mA		
0..10 V	0-1050	0.00 to +10.50 V	0-1024	0.00 to +10.24 V
0..5 V	0-525	0.00 to +5.25 V	0-509	0.00 to +5.09 V
1..5 V	75-525	+0.75 to +5.25 V	75-509	+0.75 to +5.09 V
0..20 mA	0-2100	0.00 to +21.00 mA	0-2100	0.00 to +21.00 mA
4–20 mA	300-2100	+3.00 to +21.00 mA	300-2100	+3.00 to +21.00 mA

Scale Conversion Mode (Supported only by EX600-AXB)
The scale conversion format is a feature that allows you to arbitrarily set the AD value corresponding to the input signal range within the range of -32767 to 32767. The resolution is determined by specifying the upper and lower limits of the scale.

$$\text{Resolution} = \frac{\text{Upper Range Limit} - \text{Lower Range Limit}}{\text{Upper Scale Limit} - \text{Lower Scale Limit}}$$

Example: For a 1–5 V input range



① Set the range to 1–5 V.
② Set the upper scale limit to 5000, and lower limit to 1000, the correspondence will be as follows:
1000... 1 V input
2000... 2 V input
3000... 3 V input
4000... 4 V input
5000... 5 V input
③ Since (5 V - 1 V) ÷ (5000 - 1000) = 1/1000, The range from 1 to 5 V has a resolution of 1/1000.

Scale setting value (AD value)		Input Signal Range (a–b)				
	Decimal	Voltage [V]			Current [mA]	
		0–10	1–5	0–5	0–20	4–20
Scale Upper Limit	-32766 to 32767	10	5	5	20	20
Scale Lower Limit	-32767 to 32766	0	1	0	0	4

Note: If the data format is set to scale conversion, refer to the table below to set the upper and lower scale limits.

Correspondence Table for Upper and Lower Scale Limit Settings
(Data Format: Scale Conversion)

Setting Value	Expected Value
0–32767	0 to +32767
0 to -32767	0 to -32767

<Analog Input Unit Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Analog Input Unit	Ch 7-0: Short Circuit Detection (Input)	Power Supply Short Circuit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
2		Ch 7-0: User Setting Value Upper Limit Error	Upper Limit Error	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
3		Ch 7-0: User Setting Value Lower Limit Error	Lower Limit Error	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
4		Ch 7-0: Over-Range Detection	Range Upper Limit Error Occurrence	0x00-0xFF	0: No diagnosis, 1: Diagnosis present Bit7 ... Bit0 Ch7 ... Ch0
5		Ch 7-0: Under-Range Detection	Lower Range Limit Error Occurrence	0x00-0xFF	0: No diagnosis, 1: Diagnosis present Bit7 ... Bit0 Ch7 ... Ch0

Analog Output Module (EX600-AY#/AM#)

<Analog Output Unit Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	Analog Output Unit	Analog Data Format	Data Format	Offset binary	Offset binary format	○
				SignedMagnitude	Signed binary format	
2				2's complement	2's complement format	
				Scaled	Scaled format	
3		Ch 1-0: Analog Range	Sets the range of the analog output device	0..10 V	Select the range	○
				0..5 V		
				1..5 V		
				0..20 mA		
				4..20 mA		
4		Ch 7-0: Upper Limit (0x00)	Upper Limit Error Detection Function	0x00–0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
5		Ch 1-0: Upper Limit Value	Setting the Upper Limit Value	-32766-32767 *1	Upper Limit Error Threshold	1000
6		Ch 7-0: Lower Limit (0x00)	Lower Limit Error Detection Function	0x00–0xFF	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0	0x00
7		Ch 1-0: Lower Limit Value	Setting the Lower Limit	-32766–32767 *1	Lower Limit Error Threshold	0
8		Ch 7-0: Hold State for Fieldbus Fault	Configure the behavior of the Output Behavior	0x00–0xFF	0: Hold, 1: Force ON Bit7 … Bit0 Ch7 … Ch0	0x00
9		Ch 1-0: Analog Field Comm Fault Value *2	Set the output value. (Hold State for Fieldbus Fault setting is Force ON)	Per range *1	Outputs the set value	0
10		Ch 7-0: Hold State for Fieldbus Idle	Configures the output behavior during upper-level communication Idle	0x00–0xFF	0: Hold, 1: Force ON Bit7 … Bit0 Ch7 … Ch0	0x00
11		Ch 1-0: Analog Field Comm Idle Value *3,*4	Set the output value. (Hold State for Fieldbus Idle setting is set to Force ON)	Per range *1	Outputs the set value	0
12		Short Circuit Detection (OUTPUT)	An error is generated when a short circuit is detected in the output device	Enable	Diagnostic Trigger	○
				Disable	Diagnostic triggered	

*1: Set the value for each analog output range within the configurable range shown in the table below. When changing the analog output range, be sure to check the setting and adjust it to the appropriate value. (page44)

*2: This function is enabled only when the unit parameter “Hold State for Fieldbus Fault” is set to “Force ON.”

*3: This function is enabled only when the unit parameter “Hold State for Fieldbus Idle” is set to “Force ON.”

*4: This function may not be available on certain PLC models.

Configurable range of user upper/lower limit values depending on the output range

User-configurable upper and lower limits, and the range of output values during communication errors or Idle states

Range	Configurable range for user-defined upper or lower limits		Output value during communication errors or Idle states Output value setting range
	Lower limit	Upper limit	
0..10 V	0.00 to +10.45 V	+0.05 to +10.50 V	0.00 to +10.50 V
0..5 V	0.00 to +5.22 V	+0.03 to +5.25 V	0.00 to +5.25 V
1..5 V	+0.75 to +5.22 V	+0.78 to +5.25 V	+0.75 to +5.25 V
0..20 mA	0.00 to +20.90 mA	+0.10 to +21.00 mA	0.00 to +21.00 mA
4..20 mA	+3.00 to +20.90 mA	+3.10 to +21.00 mA	+3.00 to +21.00 mA

Correspondence Table for User-Set Upper and Lower Limits and Output Settings During Communication Errors or Idle States (Data Format: Excluding Scale Conversion Format)

Range	Setting Value (Offset Binary Signed Magnitude 2's Complement)	Expected Value
0..10 V	0–1050	0.00-+10.50 V
0..5 V	0–525	0.00 to +5.25 V
1..5 V	75–525	+0.75 to +5.25 V
0..20 mA	0–2100	0.00 to +21.00 mA
4..20 mA	300–2100	+3.00 to +21.00 mA

*: If the data format is not in scale conversion format, enter the desired voltage or current value multiplied by 100 as a decimal number.

*: If the data format is set to scale conversion, configure the settings as shown below regardless of the range setting.

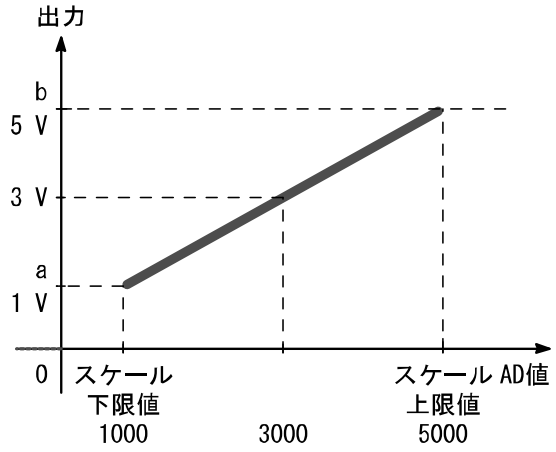
Correspondence Table for User-Set Upper and Lower Limits and Output Settings During Communication Errors or Idle States (Data Format: Scale Conversion Format)

Setting Value	Expected Value
0–32767	+0 to +32767
-0 to -32767	-0 to -32767

The scale conversion format is a feature that allows you to arbitrarily set the AD value corresponding to the output signal range within the range of -32767 to 32767. The resolution is determined by specifying the upper and lower limits of the scale.

$$\text{Resolution} = \frac{\text{Upper Range Limit} - \text{Lower Range Limit}}{\text{Upper Scale Limit} - \text{Lower Scale Limit}}$$

Example: For a 1–5 V output range



① Set the range to 1–5 V.
② Set the upper scale limit to 5000, and lower limit to 1000, the correspondence will be as follows:
1000… 1 V output
2000... 2 V output
3000... 3 V output
4,000... 4 V output
5000... 5 V output
③ Since (5 V - 1 V) ÷ (5000 - 1000) = 1/1000, The range from 1 to 5 V has a resolution of 1/1000.

Scale Setting Value (AD Value)		Output Signal Range (a–b)				
	Decimal	Voltage [V]			Current [mA]	
		0–10	1–5	0–5	0–20	4–20
Scale Upper Limit	-32766 to 32767	10	5	5	20	20
Lower limit of scale	-32767 to 32766	0	1	0	0	4

*: If the data format is set to scale conversion, configure the settings as shown below regardless of the range setting.

Correspondence Table for Scale Upper/Lower Limits and Output Settings During Communication Errors/Idle States
(Data Format: Scale Conversion Format)

Setting Value	Expected Value
0–32767	+0 to +32767
-0 to -32767	-0 to -32767

Example: If the range is set to 1–5 V (analog output range), the upper scale limit to 5000, and the lower scale limit to 1000, to set the output value during a communication error to 4 V, set the output value for communication errors to 4000.

<Analog Output Unit Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	Analog Output Unit	Ch 7-0: Short Circuit Detection (Input)	Power Supply Short Circuit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
2		Ch 7-0: User Setting Value Upper Limit Error	Upper Limit Error	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
3		Ch 7-0: User Setting Value Lower Limit Error	Lower Limit Error	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 ... Bit0 Ch7 ... Ch0
4		Ch 7-0: Over-Range Detection	Range Upper Limit Error Occurrence	0x00-0xFF	0: No diagnosis, 1: Diagnosis present Bit7 ... Bit0 Ch7 ... Ch0
5		Ch 7-0: Under-Range Detection	Lower Range Limit Error Occurrence	0x00–0xFF	0: No diagnosis, 1: Diagnosis present Bit7 ... Bit0 Ch7 ... Ch0

IO-Link Master Unit (EX600-L#B)

<IO-Link Master Unit Setting Parameters>

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
1	SIO	Ch 7-0: Hold State for Fieldbus Fault	Operation settings for Digital Output (SIO) Operation Settings	0x00-0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch7 ... Ch0	0x0F
2		Ch 7-0: Output State for Fieldbus Fault *1	When Upper-Level Communication Is Disconnected Digital Output Value Settings (When Set to "Individual")	0x00-0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch7 ... Ch0	0x00
3		Ch 7-0: Hold State for Fieldbus Idle *2	Operation Settings for Digital Outputs (SIO) During Upper-Level Communication Idle	0x00-0xFF	0: Hold, 1: Individual Bit7 ... Bit0 Ch7 ... Ch0	0x0F
4		Ch 7-0: Output State for Fieldbus Idle *2, *3	Setting the Digital Output Value During Upper-Level Communication Idle (When set to "Individual")	0x00-0xFF	0: Clear, 1: Force ON Bit7 ... Bit0 Ch7 ... Ch0	0x00
5	P1–P4	Pd Byte Swap *4	Reorders the byte sequence of process data transmitted between the host system and the IO-Link master	Direct	Data order is not rearranged	○
				Swap 16 bit	Rearrange by word	
				Swap 32 bit	Sort by double-word	
				Swap All	Swap all bytes	
6		Port Input IO-Link Size	Set the Process Data Size Setting	0–32 bytes	Set the data size for each input	16 bytes *5
7		Port Output IO-Link Size	Set the Process Data Size Setting	0–32 bytes	Set the data size for each output	16 bytes *5
8		Port Mode	Setting the IO-Link port operating mode	Deactivated	Set as an unused port	○
				IOL_Manual	Start IO-Link communication based on the IO-Link device discovery settings	
				IOL_Autostart	Start IO-Link communication without performing IO-Link device discovery	
				DI_C/Q	Digital input only	
				DO_C/Q	Digital outputs only	

<IO-Link Master Unit Setting Parameters>(continued)

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
9	P1–P4	Validation & Backup *6	Configure the connected device verification function (verification of Vendor ID and Device ID) and the data storage (DS) functions	No Device Check	Verification Function: Disabled DS Function: Disabled	○
				Type Compatible Device V1.0	Connected Device: V1.0 Verification Function: Enable DS Function: Disabled	
				Type compatible Device V1.1	Connected device: V1.1 Verification function: Enable DS Function: Disabled	
				Type compatible Device V1.1, Backup+Restore	Connected Device: V1.1 Verification Feature: Enable DS Function: Enable (Backup & RestoreA)	
				Type compatible Device V1.1, Restore	Connected Device: V1.1 Verification Feature: Enable DS Function: Enable (Restore only)	
10		Port Cycle Time	Sets the communication cycle time with IO-Link devices	0: As fast as possible	Based on the device's mincycle time	○
				1–255	1–3: 0.4 ms 4–63: 0.4–6.3 ms (in 0.1 ms increments) 64–127: 6.4–31.6 ms (in 0.4 ms increments) 128–191: 32–132.8 ms (in 1.6 ms increments) 192–255: 132.8 ms	
11		Vendor ID	Set the vendor ID to be used when the IO-Link device verification function is Enable.	0–65535	Device Vendor ID	1
12		Device ID	Set the device ID to be used when the IO-Link device verification function is Enable	0–16777215	Device ID	1

<IO-Link Master Unit: Setting Parameters>(Continued)

No.	Target	Name	Definition	Setting Value	Setting Details	Default Value
13	P1–P4	IO-Link State For Fieldbus Fault *7	When communication with the host is lost Configuration of IO-Link Communication Process Data Output	Clear/ PD Out valid	Process data output remains active remain active, and all outputs are OFF	
				Hold	Process data output remains, the IO-Link master retains the value of the process data output last received by the IO-Link module	
				Clear/ PDOut invalid	Enable process data output and turn off all process data outputs.	○
14		IO-Link State for Fieldbus Idle *7	Setting for IO-Link process data output during host communication idle	Clear/ PD Out valid	Process data output remains active remain active, and all outputs are OFF	
				Hold	Process data output remains, the IO-Link master retains the value of the process data output last received by the IO-Link module	○
				Clear/ PDOut invalid	Enable process data output and turn off all process data outputs.	○

*1 : This function is enabled only when the wireless base "Output State Fieldbus FaultIdle" is set to "Individual" and the wireless remote "Hold State for Fieldbus Fault" is set to "Individual".
*2 : This parameter includes the behavior of the wireless remote's "Output State for RF Timeout" setting, which defines the output state when wireless communication is lost.
*3 : This function is enabled when either of the following conditions is met:
・The wireless base "Output State Fieldbus FaultIdle" is set to "Individual" and the wireless remote "Hold State for Fieldbus Idle" is set to "Individual", or
・The wireless remote "Output State for RF Timeout" is set to "Individual".
*4 : Available byte-swap parameters vary depending on the process data size requirements of the connected device.
*5 : Valid when the configuration storage function is enabled. If the configuration storage function is disabled, the default value is 0 bytes.
*6 : This parameter is enabled only when the IO-Link port operating mode is set to "IOL_Manual".
*7 : For information on the behavior of connected devices under different settings, refer to "Output Settings for EtherNet/IP™ Communication Fault and Idle States / IO-Link Communication Mode (page51)."

<IO-Link Master Unit Diagnostics Parameters>

No.	Target	Name	Definition	Value	Description
1	P1–P4	Port Status Info	Port Status Info	NO_DEVICE DEACTIVATED PORT_DIAG PREOPERATE OPERATE DI_C/Q DO_C/Q	
2		Port Quality Info	Port Quality Info	0x00–0xFF	0: Process data valid 1: Process data invalid Bit 2–7 / Bit 1 / Bit 0 Reserved / Output / Input Bits 2–7 are fixed at 0.
3		Revision ID	Device IO-Link version	0x00–0xFF	
4		Transmission Rate	Communication Speed	NOT_DETECTE, COM1, COM2, COM3	
5		MasterCycle Time	Actual cycle time value	0–255	0: As fast as possible 1–3: 0.4 ms 4–63: 0.4–6.3 ms (in 0.1 ms increments) 64–127: 6.4–31.6 ms (in 0.4 ms increments) 128–191: 32–132.8 ms (in 1.6 ms increments) 192–255: 132.8 ms
6		Input Data Length	Process Input Data Length	0–32	
7		Output Data Length	Process Output Data Length	0–32	
8		Vendor ID	Vendor ID of the connected IO-Link device	0–65535	
9		Device ID	Device ID of the connected IO-Link device	0 to 16777215	

Output settings during fieldbus communication errors or Idle states / During IO-Link communication mode

When fieldbus communication is abnormal or Idle, the behavior of devices connected to the and, based on the IO-Link master settings, is as follows.

IO-Link Master Settings (Output Settings During Upper-Level Communication Faults or Idle States)		Behavior of Connected Devices
Settings	Setting Details	
Clear/ PD Out valid	While keeping process data output enabled, turns off all output points	Outputs are cleared
Hold	Process data output remains enabled, The IO-Link master retains the last process data output value received from the host	Holds the output
Clear/ PD Out invalid	Disables process data output and turns all outputs OFF	Based on the output setting function in case of IO-Link communication failure

Input/output byte swap function

The byte order of process data / output process data for the IO-Link device can be set per port. Settable parameters are shown below.

Setting	Description	Initial value
Direct	Data order does not change	○
Swap 16 Bit	Swap bytes in word units	–
Swap 32 Bit	Swap bytes in double word units	–
Swap All	Swap all bytes	–

Port setting (data format)
Example) Process data byte swap (process data size: 8 bytes)

Setting	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Original data	01	23	45	67	89	AB	CD	EF
Direct	01	23	45	67	89	AB	CD	EF
Swap 16 Bit	23	01	67	45	AB	89	EF	CD
Swap 32 Bit	67	45	23	01	EF	CD	AB	89
Swap All	EF	CD	AB	89	67	45	23	01

Example) Process data byte swap (process data size: 7 bytes)[*1]

Setting	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Original data	01	23	45	67	89	AB	CD	00
Direct	01	23	45	67	89	AB	CD	00
Swap 16 Bit	23	01	67	45	AB	89	00	CD
Swap 32 Bit [*2]	67	45	23	01	00	CD	AB	89
Swap All	00	CD	AB	89	67	45	23	01

*1: When the mapping size of the master connection process data and the process data size of the connected device are different, swap the byte with the blank byte zero.
*2: When the mapping size is 2 bytes, even though “swap 32bit” is selected, the byte will not be swapped.

Port cycle time setting

The communication cycle time is set automatically or selected from the range of 0.4 ms to 132.8 ms.

Note) The port cycle time that an IO-Link master can actually support is determined by factors such as the minimum cycle time specification of the IO-Link device, communication speed, and process data size. Even if this parameter is set to a value shorter than the supported port cycle time, communication will be performed automatically at an update cycle that the system can support.

Value	Setting range
0	Automatically set to the minimum cycle time of IO-Link device...
1 to 3	0.4ms
4 to 63	The range from 0.4 to 6.3ms can be set in 0.1ms increments.
64 to 127	The range from 6.4 to 31.6ms can be set in 0.4ms increments.
128 to 191	The range from 32.0 to 132.8ms can be set in 1.6ms increments
192 to 255	132.8ms

Data Storage Function

Set the IO-Link port operation mode to “IOL_Manual,” and further set Validation & Backup to to “Type compatible, Device V1.1, Backup + Restore” or “Type compatible, Device V1.1, Restore,” the data storage function becomes available.

・Backup and Restore Overview

You can save the parameter settings data from each IO-Link device to the IO-Link master (this is called a “backup”).

Additionally, when replacing an IO-Link device with one of the same models, you can transfer the parameter setting data backed up on the IO-Link master from the IO-Link master to the IO-Link device (referred to as “restore”).

・Conditions for Backup/Restore Operations When IO-Link Communication Starts

The operation of the data storage function depends on the data storage status within the IO-Link master and the IO-Link device’s as follows:

Validation & Backup Set value	Condition			Data Storage Operation
	Data Storage Status	Backup Requests from the Device Backup Requests	Data Storage and Device Parameter Checksum Comparison	
No Device Check	–	–	–	Clear
Type compatible, Device V1.0	–	–	–	Clear
Type compatible, Device V1.1	–	–	–	Clear
Type compatible, Device V1.1, Backup + Restore	Data included	Required	–	Backup
	Data available	No request	Mismatch	Restore
	Data present	Requests present	Match	Do nothing
	No data	–	–	Backup
Type compatible, Device V1.1, Restore	Data included	–	Mismatch	Restore
	Data present	–	Match	Do nothing
	No data	–	–	Do nothing

Note 1) If the vendor ID or device ID is changed, the data storage will be cleared.

Note 2) If the IO-Link port operating mode is changed to anything other than “IOL_Manual,” the “Validation & Backup” setting automatically switches to “No Device Check.” As a result, data storage is cleared.

Diagnostics

The EX600 IO-Link master unit diagnostic functions for each port. Diagnostic information via LEDs is displayed and is also assigned to the input process data as the port status (PQI).

・Details of PQI are shown below.

Bit	Name	Description	Value
0	ID-Mismatch	Connected Device Mismatch	0: Match 1: Mismatch
1	PD mapping-Mismatch	Process Data Mapping Size Error*1	0: Within the set size limit 1: Size exceeded
2	Pwr Short	L+ short circuit or P24 short circuit	0: No short circuit 1: Short circuit present
3	CQ Short	C/Q short circuit	0: No short circuit 1: Short circuit present
4	DS Status	Data Storage (DS) Save Status	0: DS stored data error, no DS data 1: Valid DS data
5	Dev Com	Port Communication Status	0: Device not connected 1: In Operate or Preoperate state
6	Dev Err	Event status (Device or master event status)	0: No event or Notification 1: Warning or Error
7	PQ	Received input process data Valid (Normal) / Invalid (Abnormal)*2	0: Invalid (Abnormal) 1: Valid (Normal)

*1: An error is detected when the process data size of the actually connected device exceeds the size set in the process data mapping is detected.

*2: When the received input process data is invalid (Process Data Invalid), the process data value is retained.

The LED indicators, PQI, and event codes for each diagnostic item are as follows.

Port Diagnostic Function	Description	Port LED Status	PQI Bit Number (Name)	Event Code
L+ Short Circuit Detection	Short-circuit diagnosis of pins 1–3	Red light on	2 (Pwr Short)	0x1806
P24 short circuit detected	Short-circuit diagnosis on pins 2–5	Red light on	2 (Pwr Short)	0x180F
C/Q Short Circuit Detected	Short circuit diagnosis between pins 1 and 4 or pins 3 and 4	Red light on	3 (CQ Short)	0x1804 0x1813
Connected Device Verification Error	When the port operating mode is set to IO-Link, for communication ports where the “Connected Device Verification Level” parameter is set to “Type Compatible,” the system verifies the registered Vendor ID and Device ID against the values read from the connected device, and issues an error diagnosis if there is a mismatch.	Flashing green	0 (ID Mismatch)	0x1803
Device process data Mapping error*1	When the port operating mode is set to IO-Link, an error is diagnosed if a device larger than the mapped process data length is connected.	Green flashing	1 (PD mapping-Mismatch)	0x1F01
Device Not Connected Detected*2	When the pin function/operating mode is set to IO-Link, the device detects a disconnected state	Green flashing	5 (Dev Com)	0x1800
P24 voltage drop	Diagnoses a power drop on pins 2–5 of Class B type	Lights Off (P24)	–	0x180E

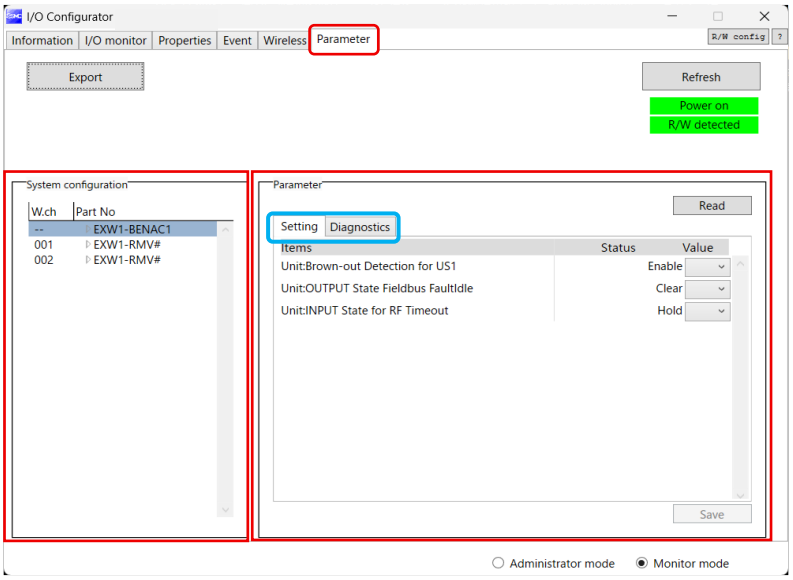
*1: In the event of a mapping error, all process data input and output values become zero

*2: When no device is connected to the port, all process data input values become zero

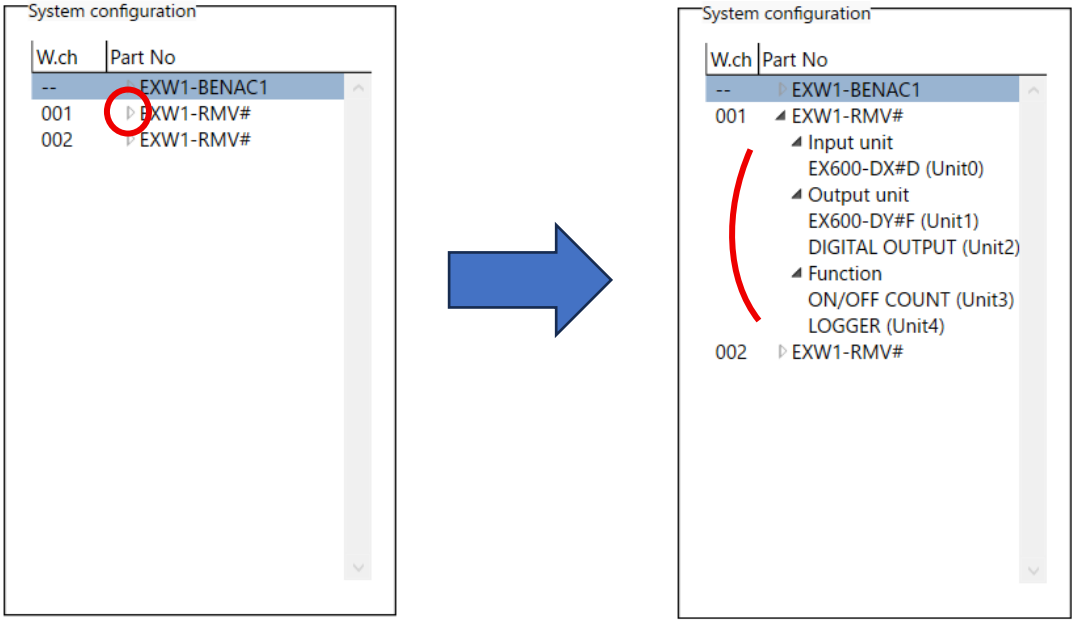
Note: Diagnostics other than short-circuit detection (L+, P24, C/Q) are not treated as EX600 diagnostic data; therefore, to check diagnostic data, please refer to the LED indicators and PQI of the IO-Link master.

Configuration Using the IO Configurator

You can configure the product's parameters from the Parameters tab in the IO Configurator. The Parameters tab consists of two areas: System Configuration and Parameters (Settings, Diagnostics).



You can view details by double-clicking the product part number displayed in "System Configuration" or by clicking the "▷" icon displayed on the left.

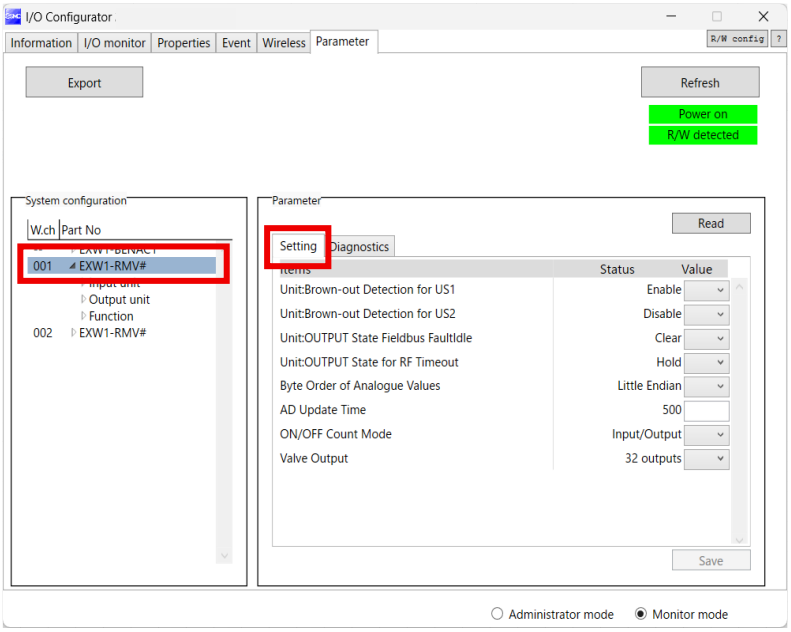


EXW1-RMV#M5C

The parameters for the EXW1-RMV#M5C wireless remote consist of four parameters: the remote unit (EXW1-RMV#), valve output (DIGITAL OUTPUT), and Function (ON/OFF COUNT, LOGGER).

- Product Part Number: EXW1-RMV#

・Settings

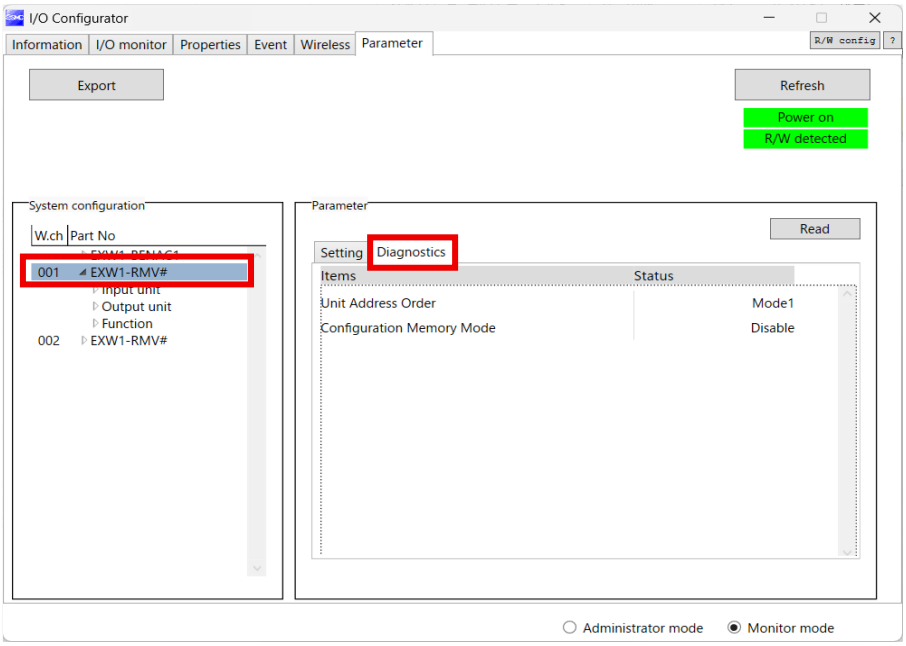


・Parameter Details

Items		Value	Default Value	Power Off Settings	Remarks
a)	Brown-out Detection for US1	Enable/Disable	Enable	Not available	US1 Power Supply Voltage Drop Detection
b)	Brown-out Detection for US2	Enable/Disable	Disable	Not available	US2 Power Supply Voltage Drop Detection
c)	Output State Fieldbus Fault *1,*2	Clear/Hold/ Individual	Clear	Not available	
d)	Output State for RF Timeout *3	Clear/Hold/ Individual	Hold	Not available	
e)	Byte Order of Analog Values	Little Endian Big Endian	Little Endian	Not available	Endian Selection
f)	AD Update Time	100 to 60000	500	Not available	When using Wireless Protocol V.2.0
		0.1, 0.2, 0.5, 1 2, 5, 10, 30, 60	0.5		When using Wireless Protocol V.1.0
g)	ON/OFF Count Mode	Input16ch Input8ch/Output8ch	Input	Not available	For Wireless Protocol V.2.0 Only
h)	Valve Output	0/8/16/24/32 Output	32 Outputs	Not available	

*1: This function is enabled only when the wireless-based “Output State Fieldbus FaultIdle” is set to “Individual.”
*2: When set to “Individual,” the parameters of each module connected to the remote unit become active.
*3: When set to “Individual,” the parameters of each module connected remotely become active.

・Diagnostics

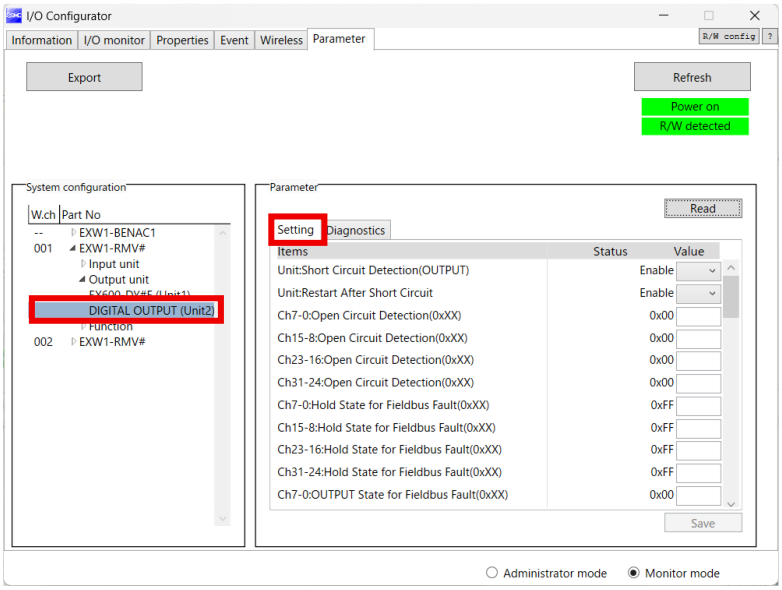


・Parameter Details

Items		Content	Value	Remarks
a)	Unit Address Order	IO Unit Assignment Direction	Mode 1	Assign to the right of the end plate
			Mode 2	Assign from the remote to the left
b)	Configuration Memory Mode	Configuration Memory Function	Enable	Configuration memory function enabled
			Disable	Configuration memory function is disabled

● Product Part Number: DIGITAL OUTPUT (Valve Output)

・Setting



・Parameter Details

	Items	Value	Default	Power Off Settings	Remarks
a)	Short Circuit Detection (Output)	Enable/Disable	Enable	Not available	
b)	Restart After Short Circuit	Enable/Disable	Enable	Not available	Enable：Auto, Disable：Manual
c)	Ch 7-0: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
d)	Ch 15–8: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8
e)	Ch 23–16: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch23 … Ch16
f)	Ch 31–24: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch31 … Ch24
g)	Ch 7-0: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0 When set to "Individual," it depends on k)
h)	Ch 15-8: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8 When set to "Individual," it depends on l)
i)	Ch 23-16: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch23 … Ch16 When set to "Individual," it depends on m)
j)	Ch 31–24: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch31 … Ch24 When set to "Individual," it depends on n)

・Parameter details(continued)

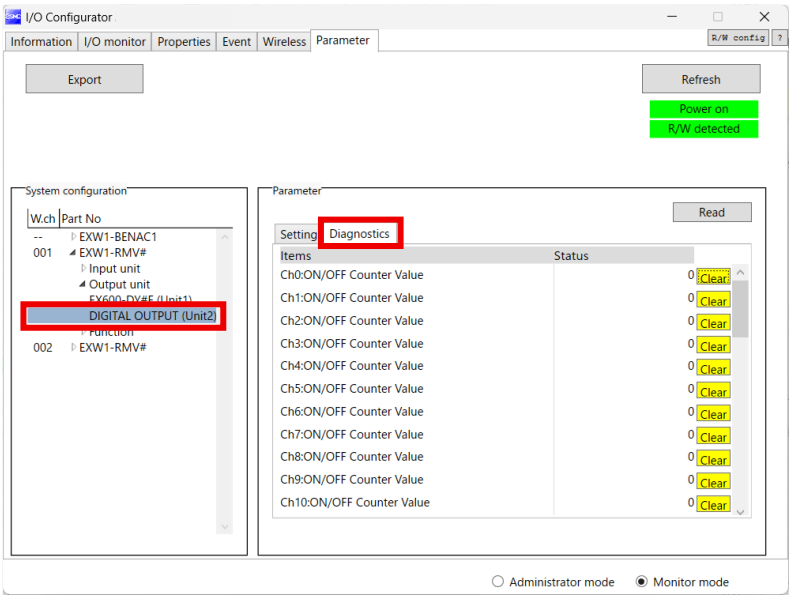
	Items	Value	Default	Power Off Settings	Remarks
k)	Ch 7-0: OUTPUT State for Fieldbus Fault *1	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0
l)	Ch 15-8: OUTPUT State for Fieldbus Fault *1	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8
m)	Ch 23–16: OUTPUT State for Fieldbus Fault *1	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch23 … Ch16
n)	Ch 31–24: OUTPUT State for Fieldbus Fault *1	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch31 … Ch24
o)	Ch 7-0: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0 When set to "Individual," it depends on s)
p)	Ch 15-8: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8 When set to "Individual," it depends on t)
q)	Ch 23-16: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch23 … Ch16 When set to "Individual," it depends on u)
r)	Ch 31-24: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch31 … Ch24 When set to "Individual," it depends on v)
s)	Ch 7-0: OUTPUT State for Fieldbus Idle *2,*3	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0
t)	Ch 15-8: OUTPUT State for Fieldbus Idle *2,*3	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8
u)	Ch 23–16: OUTPUT State for Fieldbus Idle *2,*3	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch23 … Ch16
v)	Ch 31–24: OUTPUT State for Fieldbus Idle *2,*3	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch31 … Ch24

・Parameter Details(continued)

	Items	Value	Default	Power Off Settings	Remarks
w)	Ch 7-0: ON/OFF Counter Limit Detection *4	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
x)	Ch 15-8: ON/OFF Counter Limit Detection *4	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8
y)	Ch 23-16: ON/OFF Counter Limit Detection *4	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch23 … Ch16
z)	Ch 31–24: ON/OFF Counter Limit Detection *4	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch31 … Ch24
aa)	Ch #: Counter Limit Value (1k–65,000k) *5	1–65,000	65000	Not available	The number of times this is set is equal to the set value multiplied by 1000.

*1: This function is enabled only when the unit parameter “Hold State for Fieldbus Fault” is set to “Individual.”
*2: This function is enabled only when the unit parameter “Hold State for Fieldbus Idle” is set to “Individual.”
*3: This function may not be available on certain PLC models.
*4: The count value is saved every hour. When the power is turned back on, the count resumes from the last saved value.
*5: The set count is equal to the set value multiplied by 1,000.

・Diagnostics



・Parameter Details

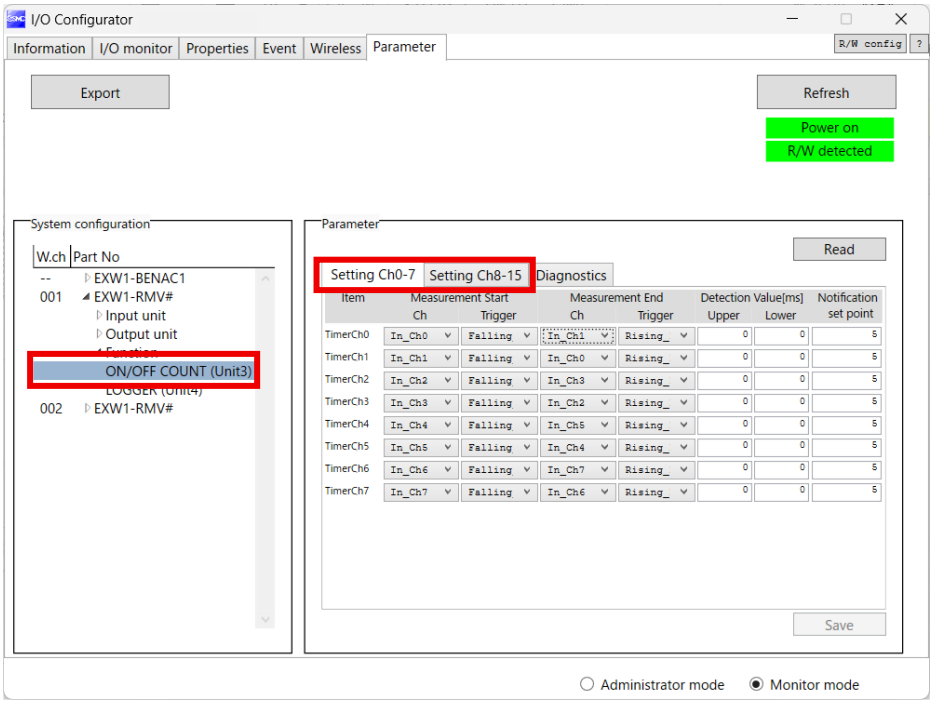
	Items	Status	Remarks
a)	Ch #: ON/OFF Counter Value	0–4294967295	Number of ON/OFF operations for the output device on each channel
		Clear	Resets the ON/OFF operation count for the output device to 0
b)	Ch 7-0: ON/OFF Counter Limit Exceeded	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

・Parameter Details(Continued)

Items		Status	Remarks
c)	Ch 15–8: ON/OFF Counter Limit Exceeded	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
d)	Ch 23–16: ON/OFF Counter Limit Exceeded	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
e)	Ch 31–24: ON/OFF Counter Limit Exceeded	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
f)	Ch 7-0: Open Circuit Detection	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
g)	Ch 15–8: Open Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
h)	Ch 23-16: Open Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
i)	Ch 31–24: Open Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
j)	Ch 7-0: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
k)	Ch 15-8: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
l)	Ch 23–16: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
m)	Ch 31–24: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

- Product Part Number: ON/OFF COUNT

This parameter is related to the “ON/OFF Time Measurement Function (page221)” and the “Logging and Notification Functions (page226).”
It is supported only by wireless protocol V.2.0.

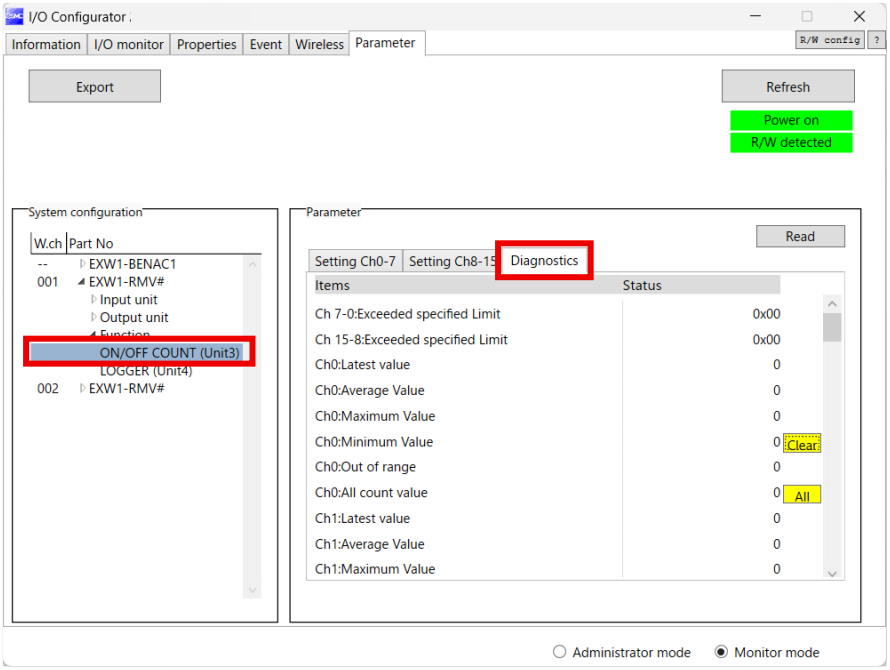


・Parameter Details (Setting Ch0-7, Setting Ch8-15)

Items				Value	Default	Power Off Settings	Remarks
a)	Ch #: Timer Trigger	Measurement Start	Ch	In_Ch0 to In_Ch15 Out_Ch0 to Out_Ch8	page225	Not available	For details, refer to “ON/OFF Time Measurement Function (page221)” and “Log and Notification Functions (page226).”
b)			Trigger	Rising_Edge Falling_Edge Both Edges		Not available	
c)		Measurement End	Ch	In_Ch0 to In_Ch15 OutCh0 to OutCh8		Not available	
d)			Trigger	Rising_Edge Falling_Edge Both Edges		Not available	
e)	Ch #: Upper Limit Detection Value *1			0–65535	0	Not available	
f)	Ch #: Lower Limit Detection Value *1			0–65535	0	Not available	
g)	Ch #: Notification set point *1*2			0-65535	5	Not available	

*1: A value of 0 disables the setting. For details, see “Logging and Notification Features (page226).”
*2: For details, please refer to the “Logging and Notification Features (page226).”

・Parameter Details (Diagnostics)



・Parameter Details

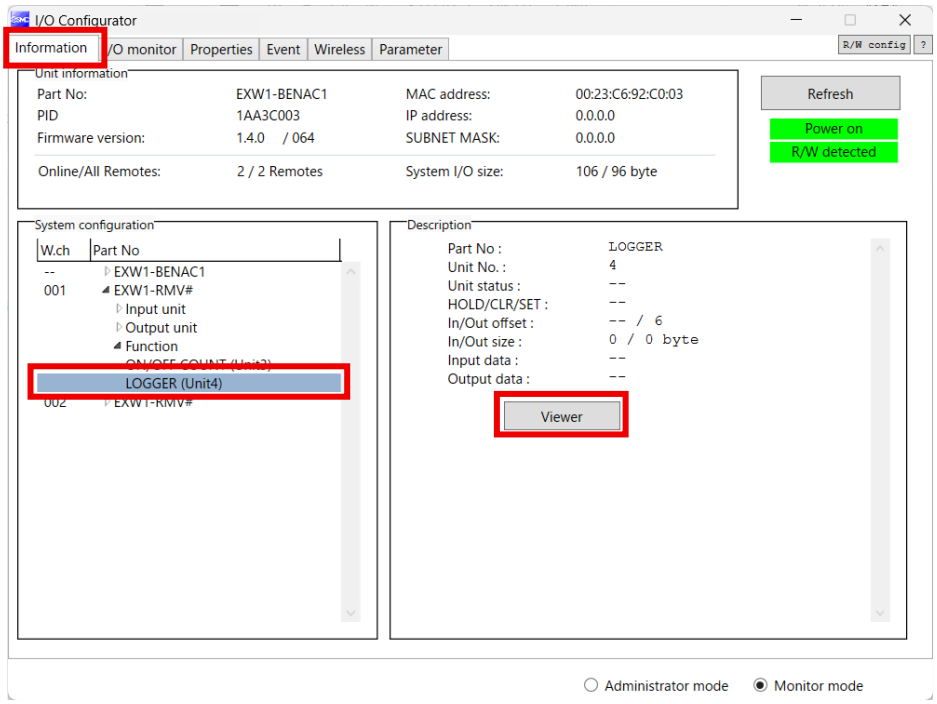
Items		Status	Remarks		
a)	Ch 7-0: Exceeded Specified Limit	0x00-0xFF	0: No diagnosis, 1: Diagnosis present		
			Bit7	…	Bit0
			Timer 7	…	Timer0
b)	Ch 15-8: Specified Limit Exceeded *1	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Timer15	…	Timer 8
c)	Ch #: Latest value *2	0-65535 ms	Latest value for ON/OFF measurement time (page231)		
d)	Ch #: Average value *2	0-65535 ms	Average ON/OFF measurement time (page231)		
e)	Ch #: Maximum value *2	0-65535 ms	Maximum ON/OFF measurement time (page231)		
f)	Ch #: Minimum value *2	0-65535 ms	Minimum ON/OFF measurement time (page231)		
g)	Ch #: Out of range *3	0-65,535 times	Number of measurements outside the threshold (page231)		
h)	Ch #: Total count *4	0-4,294,967,295 times	Total number of measurements (page231)		
i)	Ch #: Clear	Clear	The following will be cleared. Ch #: Latest value, Ch #: Average value Ch #: Maximum value, Ch #: Minimum value		
		All (Clear All)	The following will be cleared. Ch #: Latest value, Ch #: Average value Ch #: Maximum value, Ch #: Minimum value Ch #: Out of range, Ch #: Total count		

*1: The number of channels depends on the number of occupied points of the connected input modules.
*2: This value is 0 if the ON/OFF time measurement function has not been used.
For details, please refer to the “Acquired Data” page (page231).
*3: This data is acquired when a threshold setting is enabled (non-zero) and the value falls outside the threshold.
For details, please refer to the “Logging and Notification Functions (page226).”
*4: For details, please refer to “Acquired Data (page231).”

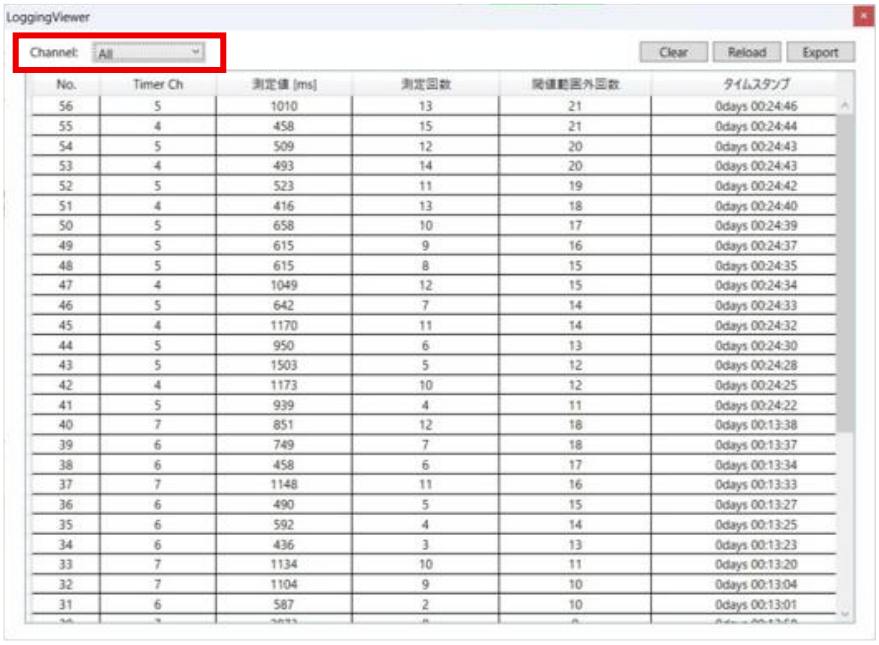
ON/OFF COUNT is available only with Wireless Protocol V.2.0.

- Product Model Number: LOGGER

You can view LOGGER from the Information tab. It supports only Wireless Protocol V.2.0.

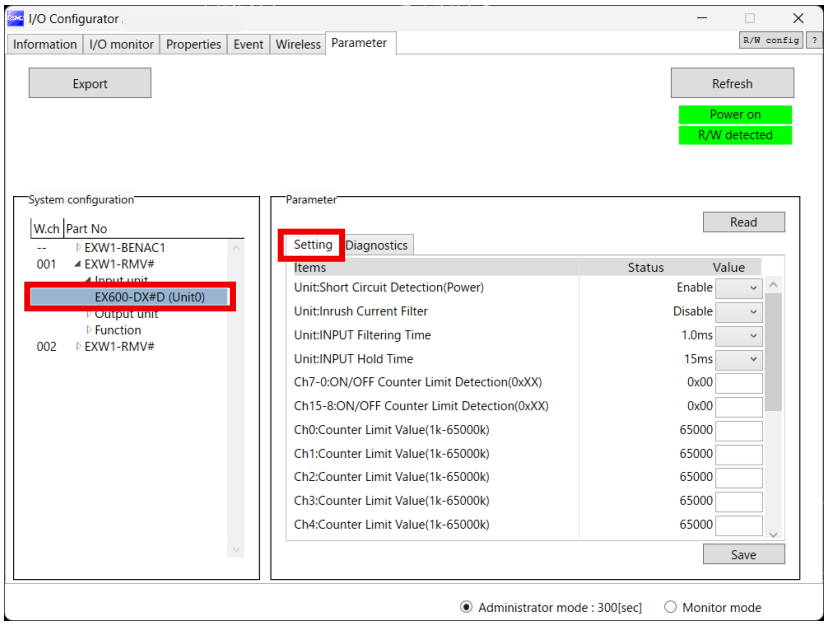


Clicking “Viewer” displays the screen shown below.
You can view up to 40 entries at once, starting with the most recent log.
You can also select individual Timer Channels from the “Channel” menu and view up to 5 entries from the history of the selected channel.
You can also export the data as a CSV file using the “Export” function.
For details, please refer to “Log and Notification Functions (page226).”



EX600-DX# / DM# (Digital Input Module)

・Settings



・Parameter Details

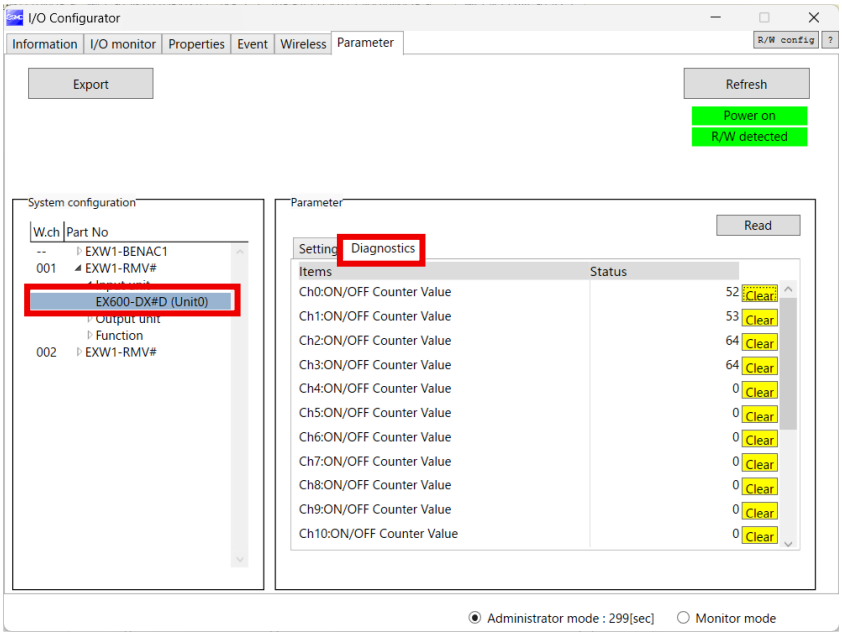
	Items	Value	Default	Power Off Settings	Remarks
a)	Short Circuit Detection (Power)	Enable/Disable	Enable	Not available	
b)	Open-circuit detection *1	Enable/Disable	Disable	Not available	EX600-DX#C1 only
c)	Inrush Current Filter	Enable/Disable	Disable	Not available	
d)	Input Filtering Time	0.1/1.0/10/20 ms	1.0 ms	Not available	
e)	Input Hold Time	1.0/15/100/200 ms	15 ms	Not available	
f)	Ch 7-0: ON/OFF Counter Limit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
g)	Ch 15–8: ON/OFF Counter Limit Detection* 2	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8
h)	Ch #: Counter Limit Value (1k–65000k) * 3	1–65000	65000	Not available	The number of times the setting is applied is equal to the set value multiplied by 1,000

*1: If the input device used is a 2-wire type, input devices (such as contact sensors) with a leakage current of 0.5 mA or less when OFF will cause false detections.Use input devices with a leakage current of 0.5 mA or more when OFF. If the input device used is a 3-wire type, input devices with a current consumption of 0.5 mA or less will cause false detections. Additionally, a break in the input signal line cannot be detected.

*2: The count value is saved every hour.When the power is turned back on, the count resumes from the last saved value.

*3: The set count is equal to the set value multiplied by 1,000.

・Diagnostics

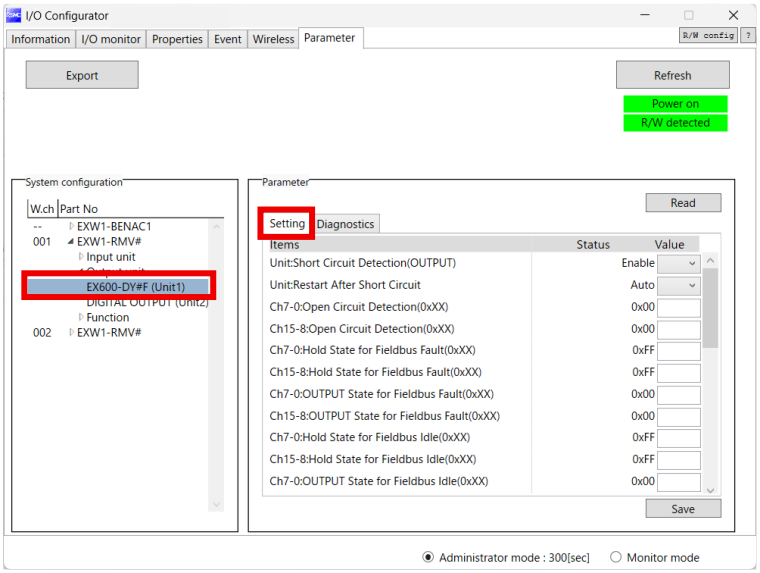


・Parameter Details

Items		Status	Remarks
a)	Ch #: ON/OFF Counter Value	0–4294967295	Number of ON/OFF operations for the output device on each channel
		Clear	Resets the ON/OFF operation count for the output device to 0
b)	Ch 7-0: ON/OFF Counter Limit Exceeded	0x00-0xFF	0: No diagnosis, 1: Diagnosis Bit7 … Bit0 Ch7 … Ch0
c)	Ch 15–8: ON/OFF Counter Limit Exceeded	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
d)	Ch 7-0: Short Circuit Detection (Input)	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
e)	Ch 15-8: Short Circuit Detection (Input)	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

EX600-DY# / DM# (Digital Output Module)

・Settings



・Parameter Details

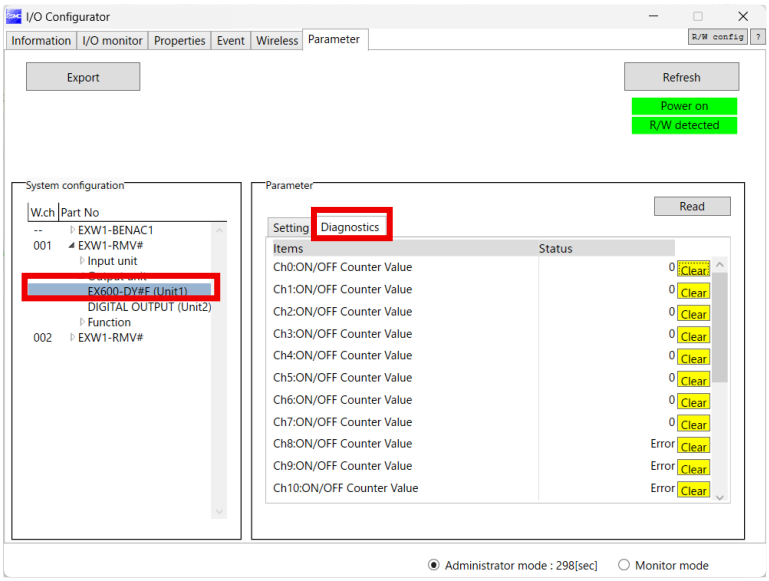
Items		Value	Default	Power Off Settings	Remarks
a)	Short Circuit Detection (Output) *1	Enable/Disable	Enable	Not available	
b)	Restart After Short Circuit	Auto/Manual	Auto	Not available	
c)	Ch 7-0: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
d)	Ch 15–8: Open Circuit Detection	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8
e)	Ch 7-0: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0 When set to "Individual," it depends on g)
f)	Ch 15-8: Hold State for Fieldbus Fault	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8 When set to "Individual," it depends on h)
g)	Ch 7-0: Output State for Fieldbus Fault *2	0x00–0xFF	0x00	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0
h)	Ch 15-8: Output State for Fieldbus Fault *2	0x00–0xFF	0x00	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch15 … Ch8
i)	Ch 7-0: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0 When set to "Individual," it depends on k)

・Parameter Details(continued)

	Items	Value	Default	Power Off Settings	Remarks
j)	Ch 15-8: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Individual Bit7 … Bit0 Ch7 … Ch0 When set to "Individual," it is determined by l)
k)	Ch 7-0: OUTPUT State for Fieldbus Idle *3,*4	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch7 … Ch0
l)	Ch 15-8: OUTPUT State for Fieldbus Idle *3,*4	0x00–0xFF	0x00	Not available	0: Clear, 1: Force ON Bit7 … Bit0 Ch15 … Ch8
m)	Ch 7-0: ON/OFF Counter Limit Detection *5	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
n)	Ch 15-8: ON/OFF Counter Limit Detection *5	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch15 … Ch8
o)	Ch #: Counter Limit Value (1k–65,000k) * 6	1–65,000	65000	Not available	The number of times this is set is equal to the set value multiplied by 1,000.

*1: If the load you are using (e.g., a lamp load) is falsely detected as a short circuit, please disable this setting.
*2: This function is enabled only when the unit parameter “Hold State for Fieldbus Fault” is set to “Individual.”
*3: This function is enabled only when the unit parameter “Hold State for Fieldbus Idle” is set to “Individual.”
*4: This feature may not be available on certain PLC models.
*5: The count value is saved every hour. When the power is turned back on, the count resumes from the last saved value.
*6: The set count is equal to the set value multiplied by 1,000.

・Diagnostics

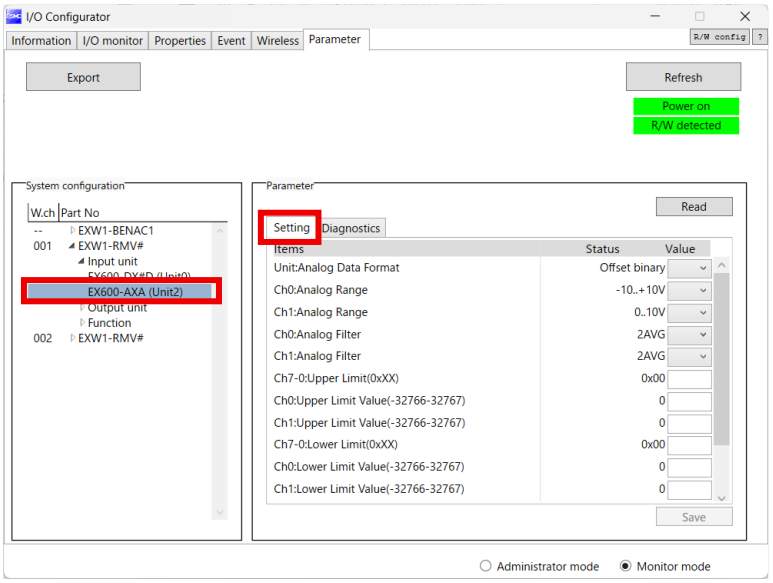


・Parameter Details

Items		Status	Remarks		
a)	Ch #: ON/OFF Counter Value	0–4294967295	Number of ON/OFF operations for the output device on each channel		
		Clear	Resets the ON/OFF operation count for the output device to 0		
b)	Ch 7-0: ON/OFF Counter Limit Exceeded	0x00-0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch7		Ch0
c)	Ch 15–8: ON/OFF Counter Limit Exceeded	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch15		Ch8
d)	Ch 7-0: Open Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch7		Ch0
e)	Ch 15-8: Open Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch15		Ch8
f)	Ch 7-0: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch7		Ch0
g)	Ch 15-8: Short Circuit Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled		
			Bit7	…	Bit0
			Ch15		Ch8

EX600-AX# / AM# (Analog Input Module)

・Settings



・Parameter Details

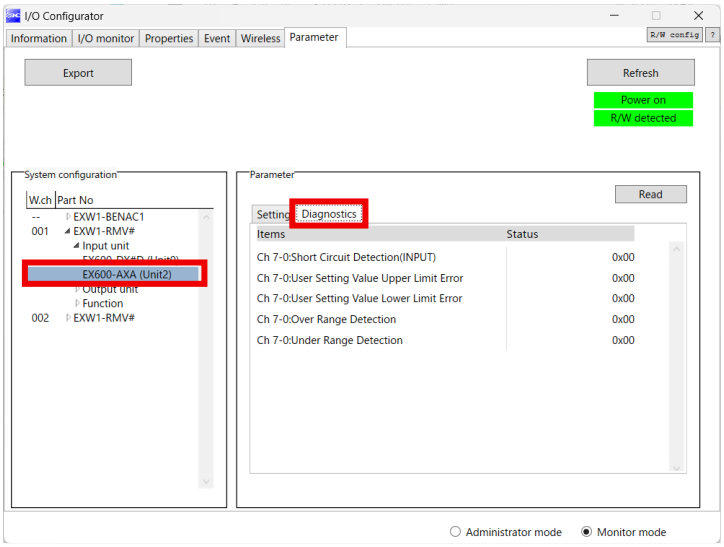
Items		Value	Default	Power Off Settings	Remarks
a)	Analog Data Format	Offset binary Signed Magnitude 2's complement Scaled	Offset binary	Not available	Scale conversion format is AXB only
b)	Ch 1-0: Analog Range	-10.. +10 V -5.. +5 V -20.. +20 mA 0..10 V 0..5 V 1..5 V 0..20 mA 4..20 mA	-10.. +10 V (AXA) 0..5 V (AXB)	Not available	AXB cannot be set to the -10.. +10 V or -5.. +5 V/-20.. +20 mA ranges
c)	Ch 1-0: Analog Filter	None 2AVG 4AVG 8AVG	2AVG	Not available	
d)	Ch 7-0: Upper Limit (0x00)	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 ... Bit0 Ch7 ... Ch0
e)	Ch 1-0: Upper Limit Value (-32766–327687) *1	-32766～32767	1000	Not available	Scaled format
		Per range	1000	Not available	Other than scaled format The configurable range varies by range

・Parameter details(continued)

Items		Value	Default	Power Off Settings	Remarks
f)	Ch 7-0: Lower Limit (0x00)	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
g)	Ch 1-0: Lower Limit Value (-32766–327687) *1	-32766～32767	1000	Not available	Scaled format
		Per range	1000	Not available	Other than scaled format The configurable range varies by range
h)	Short Circuit Detection (Power)	Enable/Disable	Enable	Not available	
i)	Over Range	Enable/Disable	Enable	Not available	
j)	Under Range	Enable/Disable	Enable	Not available	

*1: Please set the values within the configurable range for each analog input range. (page40)
When changing the analog input range, be sure to check the setting and adjust it to the appropriate value.

・Diagnostics

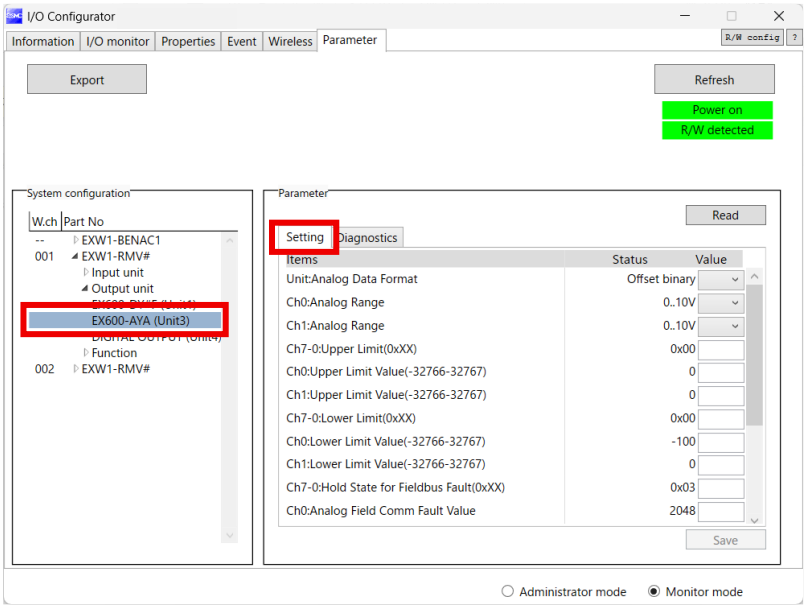


・Parameter Details

Items		Status	Remarks
a)	Ch 7-0: Short Circuit Detection (Input)	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
b)	Ch 7-0: User Setting Value Upper Limit Error	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
c)	Ch 7-0: User Setting Value Lower Limit Error	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
b)	Ch 7-0: Over-Range Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
e)	Ch 7-0: Out-of-Range Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

EX600-AY# / AM# (Analog Output Module)

・Settings



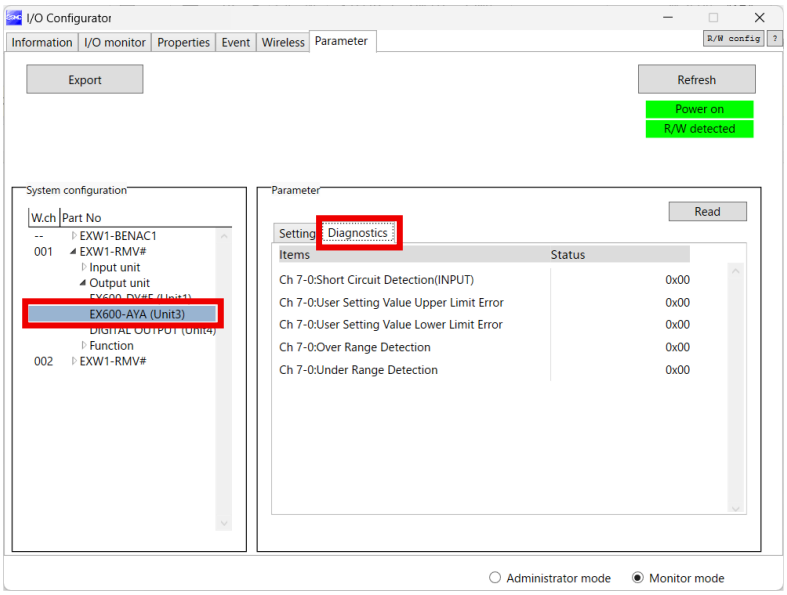
・Parameter Details

Items		Value	Default	Power Off Settings	Remarks
a)	Analog Data Format	Offset binary Signed Magnitude 2's complement Scaled	Offset binary	Not available	
b)	Ch #: Analog Range	0..10 V 0..5 V 1..5 V 0..20 mA 4..20 mA	0..10 V	Not available	
c)	Ch 7-0: Upper Limit (0x00)	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
d)	Ch #: Upper Limit Value (-32766–327687)	Per range	1000	Not available	The configurable range varies by range
e)	Ch 7-0: Lower Limit (0x00)	0x00–0xFF	0x00	Not available	0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
f)	Ch #: Lower Limit Value (-32766–327687)	Per range	0	Not available	The configurable range varies by range
g)	Ch 7-0: Hold State for Fieldbus Fault (0x00)	0x00–0xFF	0xFF	Not available	0: Hold, 1: Force ON Bit7 … Bit0 Ch7 … Ch0 When "Force ON" is set, as described in h)
h)	Ch #: Analog Field Comm Fault Value	Per range	0	Not available	The configurable range varies by range

・Parameter Details(continued)

	Items	Value	Default	Power Off Settings	Remarks
i)	Ch 1-0: Hold State for Fieldbus Idle	0x00–0xFF	0xFF	Not available	0: Hold, 1: Force ON Bit7 … Bit0 Ch7 … Ch0 When set to Force ON, as specified in j)
j)	Ch 1-0: Analog Field Comm Fault Value	Per range	0	Not available	The configurable range varies by range
k)	Short Circuit Detection (Power)	Enable/Disable	Enable	Not available	

・Diagnostics



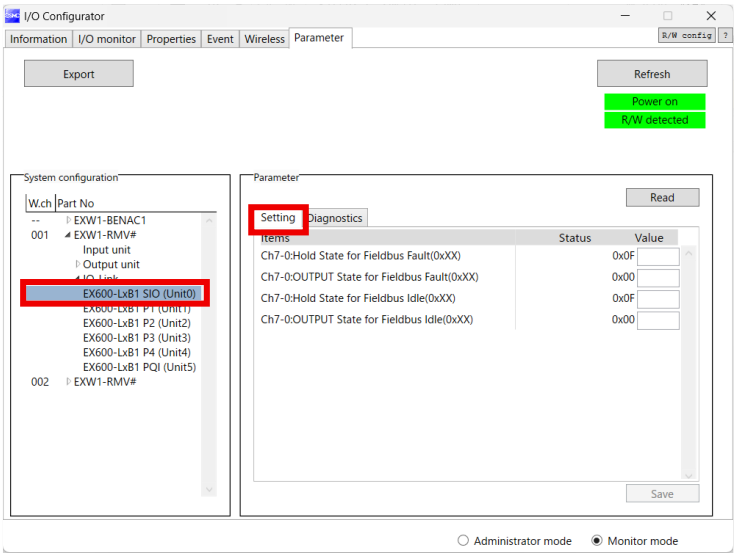
・Parameter Details

	Items	Status	Remarks
a)	Ch 7-0: Short Circuit Detection (Input)	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
b)	Ch 7-0: User Setting Value Upper Limit Error	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
c)	Ch 7-0: User Setting Value Lower Limit Error	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
b)	Ch 7-0: Over-Range Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
e)	Ch 7-0: Out-of-Range Detection	0x00–0xFF	0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

EX600-L#B (IO-Link Master Module)

- Product Part Number: EX600-LxB1 SIO (Unit 0)

・Settings



・Parameter Details

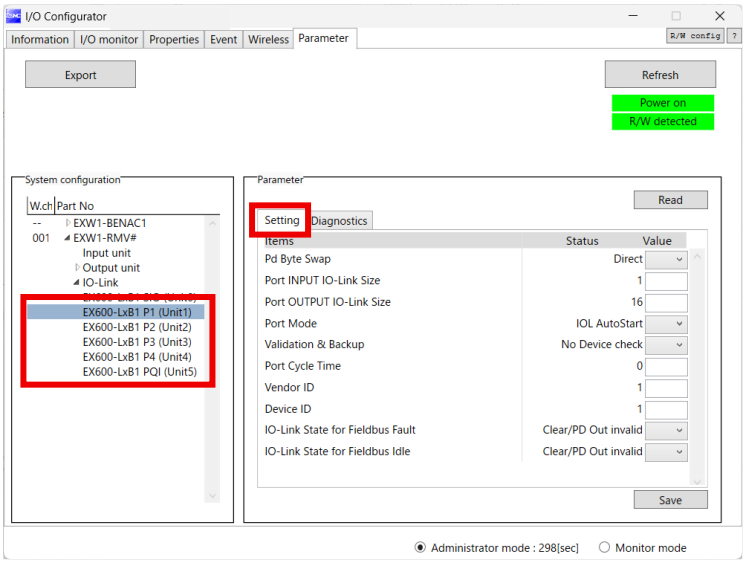
Items		Value	Default	Power Off Settings	Remarks
a)	Ch 7-0: Hold State for Fieldbus Fault	0x00–0x0F	0x0F	Not available	0: Hold, 1: Individual Bit4–7 / Bit3 / … / Bit0 Reserved / P4 / … / P1 When set to "Individual," follow b). Bits 4–7 are fixed at 0.
b)	Ch 7-0: Output State for Fieldbus Fault	0x00–0x0F	0x00	Not available	0: OFF, 1: ON Bits4–7 / Bit3 / … / Bit0 Reserved / P4 / … / P1 Bits 4–7 are fixed at 0.
c)	Ch 7-0: Hold State for Fieldbus Idle	0x00–0x0F	0x0F	Not available	0: Hold, 1: Individual Bit 4–7 / Bit3 / … / Bit0 Reserved / P4 / … / P1 For "Individual" settings, follow step d). Bits 4–7 are fixed at 0.
d)	Ch 7-0: Output State for Fieldbus Idle	0x00–0x0F	0x00	Not available	0: OFF, 1: ON Bit4–7 / Bit3 / … / Bit0 Reserved / P4 / … / 1. P1 Bits 4–7 are fixed at 0.

・Diagnostics

No parameters

- Product Part Number: EX600-LxB1 P1/P2/P3/P4 (Units 1–4)

・Settings



・Parameter Details

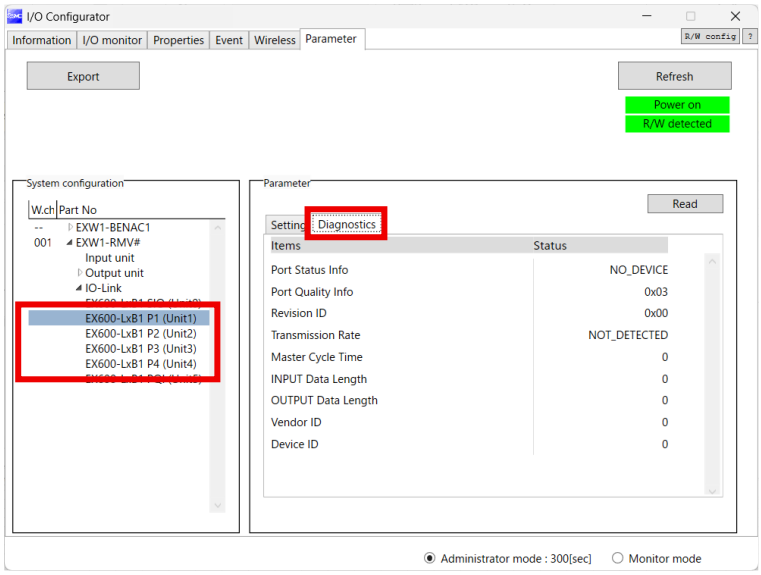
Items		Value	Default Value	Power Off Settings	Remarks
a)	Pd Byte swap *1	Direct / Swap 16 bit / Swap 32 bit / Swap All	Direct	Not available	Reorders the byte sequence of process data transmitted between the upper-level communication system and the IO-Link master
b)	Port Input IO-Link Size	0–32 bytes	32 bytes	Not available	Increase or decrease in 1-byte increments.
c)	Port Output IO-Link Size	0–32 bytes	32 bytes	Not available	Increase or decrease in 1-byte increments.
d)	PortMode	Deactivated/IOL_Manual/ IOL_Autostart/DI C/Q/DO C/Q	Deactivated	Not available	
e)	Validation & Backup *2	No Device Check/ Type-compatible Device V1.0/ Type-compatible Device V1.1/ Type-Compatible Device V1.1, Backup + Restore/ Type-Compatible Device V1.1, Restore	No Device Check	Not available	
f)	Port Cycle Time *3	0–255	0	Not available	Actual cycle time value 0: As fast as possible 1–3: 0.4 ms 4–63: 0.4–6.3 ms (in 0.1 ms increments) 64–127: 6.4–31.6 ms (in 0.4 ms increments) 128–191: 32–132.8 ms (in 1.6 ms increments) 192–255: 132.8 ms

・Parameter Details(continued)

Items		Value	Default	Power-off setting	Remarks
g)	Vendor ID	0–65535	1	Not available	Set the vendor ID to be used when the IO-Link device verification function is Enable
h)	Device ID	0–16777215	1	Not available	Set the device ID to be used when the IO-Link device verification function is Enable
i)	IO-Link State for Fieldbus Fault *4	Clear (Data Valid)/ Clear (Data Invalid) / Hold	Clear/ PD Out invalid	Not available	Clear/ PD Out valid: Process data output remains valid, but all output points are turned OFF Clear/ PD Out invalid: Process data output remains Enable, and the IO-Link master retains the last process data output value it received Hold: Disables process data output and turns all outputs OFF
j)	IO-Link State for Fieldbus Idle *4	Clear (Data Valid) / Clear (Data Invalid) / Hold	Clear/ PD Out invalid	Not available	

*1: The available byte-swap parameters vary depending on the process data size of the connected device. For details, refer to "Input/Output Byte Swap Function" (page51).
*2: This parameter is valid only when the IO-Link port operating mode is set to "Manual". For details, refer to "Data Storage Function" (page53)
*3: The minimum configurable cycle time varies depending on factors such as the minimum cycle time, communication speed, and process data size of the IO-Link device. If automatic setting is selected, or if a value below the minimum configurable cycle time is specified, the actual operating cycle time will be set to the minimum configurable value. For details, refer to "Port Cycle Time Setting" (page52).
*4: For information on the behavior of the connected device under different settings, refer to " Output settings during fieldbus communication errors or Idle states / During IO-Link communication mode" (page51).

・Diagnostics



・Parameter Details

Items		Status	Remarks
a)	Port Status Info	NO_DEVICE / DEACTIVATED/ PORT_DIAG / PREOPERATE/ OPERATE / DI_C/Q / DO_C/Q	
b)	Port Quality Info	0x00–0x03	0: Process data Valid 1: Process data Invalid Bits 2–7 / Bit 1 / Bit 0 Reserved / Output / Input Bits 2–7 are fixed at 0.
c)	Revision ID	0x00–0xFF	IO-Link version of the IO-Link device
d)	Transmission Rate	NOT_DETECTED, COM1, COM2, COM3	Data Transfer Speed
e)	Master Cycle Time	0–255	Actual cycle time value 0: As fast as possible 1–3: 0.4 ms 4–63: 0.4–6.3 ms (in 0.1 ms increments) 64–127: 6.4–31.6 ms (in 0.4 ms increments) 128–191: 32–132.8 ms (in 1.6 ms increments) 192–255: 132.8 ms
f)	Input Data Length	0–32	Process input data length
g)	Output Data Length	0–32	Process output data length
h)	Vendor ID	0–65535	Vendor ID of the connected IO-Link device
i)	Device ID	0–16777215	Device ID of the connected IO-Link device

- Product Part Number: EX600-LxB1 PQI (Unit 5)

・Setting

No parameters

・Diagnostics

No parameters

EtherCAT®

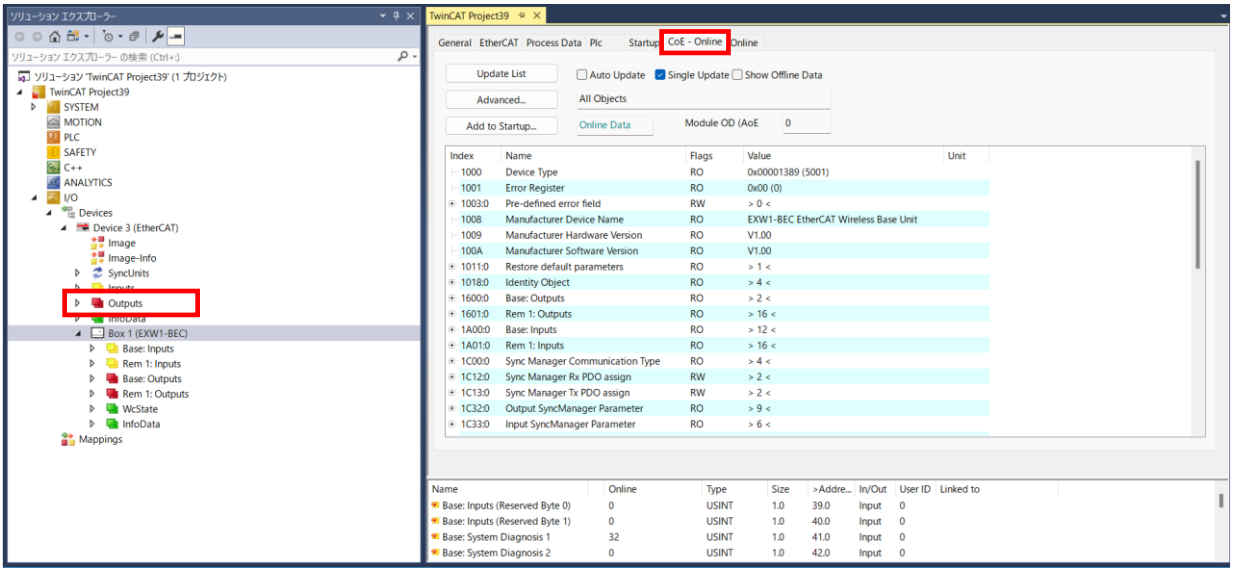
Please refer to the EXW1-BECAC instruction manual for information on how to connect it to a Beckhoff PLC. For detailed operating procedures, refer to Beckhoff's manual.

When using Wireless Protocol V.2.0, use the CoE Object Dictionary to check diagnostic data, read and write various parameters

When using Wireless Protocol V.1.0, CoE Object Dictionary is not supported. For checking diagnostic data and reading and writing various parameters, please use the IO Configurator.

■How to display CoE object

After selecting [Box1(EXW1-BEC)], select the [CoE-Online] tab to display the CoE object.



・Supported object

Index	Name	Fixed value
0x1000	Device type	0x00001389
0x1008	Manufacturer Device name	EXW1-BEC EtherCAT Wireless Base Unit
0x1009	Hardware version	V1.00
0x100A	Software version	V1.00
0x1018:0	Identity	0x04
0x1018:01	Vendor ID	0x00000114
0x1018:02	Product code	0x01000047
0x1018:03	Revision Number	0x00010000
0x1018:04	Serial Number	0x#########
0x6000 - 0x63E9	Input PDOs	Input PDOs for the remotes
0x7000 - 0x73E9	Output PDOs	Output PDOs for the remotes
0x8000 – 0x83E9	Parameter Settings	Parameter setting data for the remotes
0x9000 – 0x93E0	Module Identification	Detected Module Ident List
0xA000 – 0xA3E9	Diagnostics	Diagnostics
0xF000 – 0xF800	Device Area	Parameter setting data for the EXW1-BEC IO-Link Access、Remote Access

Modular device profile

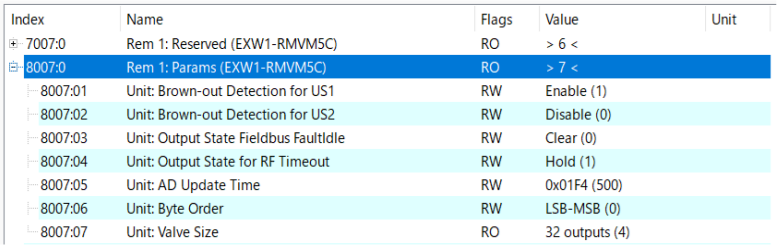
The wireless network is represented as a modular device in the CoE table.

CoE objects for remotes:
The slot / subslot system is emulated using the following logic:

Index 0xTMMN :
T -> Topic: 6, 7, 8, 9, A for inputs, outputs, parameters, module info and diagnostics respectively
MM -> Module number 0x00-0x3E, usually wireless channel - 1
N -> Function Remotes are made up of functions

EXW1-RMV#M5C

● Params (EXW1-RMVM5C)



Index	Name	Flags	Value	Unit
7007:0	Rem 1: Reserved (EXW1-RMVM5C)	RO	> 6 <	
8007:0	Rem 1: Params (EXW1-RMVM5C)	RO	> 7 <	
8007:01	Unit: Brown-out Detection for US1	RW	Enable (1)	
8007:02	Unit: Brown-out Detection for US2	RW	Disable (0)	
8007:03	Unit: Output State Fieldbus FaultIdle	RW	Clear (0)	
8007:04	Unit: Output State for RF Timeout	RW	Hold (1)	
8007:05	Unit: AD Update Time	RW	0x01F4 (500)	
8007:06	Unit: Byte Order	RW	LSB-MSB (0)	
8007:07	Unit: Valve Size	RO	32 outputs (4)	

Index	Name	Definition	Flag	Size	Value (Default)
0x8MMN:0	Rem #: Params (EXW1-RMVM5C)	-	RO	-	7
0x8MMN:01	Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	R/W	byte	0x00: Disable 0x01: Enable
0x8MMN:02	Brown-out Detection for US1	US2 (for outputs) Power Supply Voltage Drop	R/W	byte	0x00: Disable 0x001: Enable
0x8MMN:03	Output State Fieldbus FaultIdle	Specifies the output state when communication with the host is lost or during Idle mode	R/W	byte	0x00 : Clear 0x01 : Hold 0x02 : Individual
0x8MMN:04	Output State for RF Timeout	Output settings when wireless communication is lost (timeout)	R/W	byte	0x00 : Clear 0x01 : Hold 0x02 : Individual
0x8MMN:05	AD Update Time	Analog Update Time	R/W	2 bytes	100-60000(500)
0x8MMN:06	Byte Order	Endian Type (Analog and IO-Link)	R/W	byte	0x00 : LSB-MSB(Little Endian) 0x01 : MSB-LSB(Big Endian)
0x8MMN:07	Valve Size	Number of occupied points on the valve manifold	R/W	byte	0x00 : 0 points 0x01 : 8 points 0x02 : 16 points 0x03 : 24 points 0x04 : 32 points

● Diags (EXW1-RMV)

Index	Name	Flags	Value
A006:0	Rem 1: Diags (EXW1-RMV)	RO	> 112 <
A006:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)
A006:02	Ch 15-8: ON/OFF Counter Limit Detection	RW	0x00 (0)
A006:03	Ch 23-16: ON/OFF Counter Limit Detection	RW	0x00 (0)
A006:04	Ch 31-24: ON/OFF Counter Limit Detection	RW	0x00 (0)
A006:05	Ch 0: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)
A006:06	Ch 1: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-RMV)	-	RO	-	112
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02	Ch 15-8: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:03	Ch 23-16: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
0xAMMN:04	Ch 31-24: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
0xAMMN:05 : 0xAMMN:24	Ch # ON/OFF Counter Limit Value (1k-65000k)	Setting the number of ON/OFF cycles	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:25 : 0xAMMN:44	Ch # ON/OFF Counter Value	ON/OFF Operation Count	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 Number of ON/OFF cycles per channel
0xAMMN:45 : 0xAMMN:64	Ch # ON/OFF Counter Clear	ON/OFF Clear operation count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0

Diags (EXW1-RMV) (continued)

Index	Name	Definition	Flag	Size	Value (Default)		
0xAMMN:65	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value has exceeded the set value	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:66	Ch 15-8: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8
0xAMMN:67	Ch 23-16: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch23	…	Ch16
0xAMMN:68	Ch 31-24: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch31	…	Ch24
0xAMMN:69	Ch 7-0: Open Circuit Detection	Detects an open circuit	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:6A	Ch 15-8: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8
0xAMMN:6B	Ch 23-16: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch23	…	Ch16
0xAMMN:6C	Ch 31-24: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch31	…	Ch24

Diags (EXW1-RMV) (continued)

Index	Name	Definition	Flag	Size	Value (Default)		
0xAMMN:6D	Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:6E	Ch 15-8: Short Circuit Detection (Output)		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8
0xAMMN:6F	Ch 23-16: Short Circuit Detection (Output)		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch23	…	Ch16
0xAMMN:70	Ch 31-24: Short Circuit Detection (Output)		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch31	…	Ch24

● Diags (EXW1-RMVM5C)

A009:0	Rem 1: Diags (EXW1-RMVM5C)	RO	> 3 <
A009:01	Unit: Unit Address Order	RO	Mode 1 (0)
A009:02	Unit: ON/OFF Count Mode	RW	Input 16ch (32)
A009:03	Unit: Configuration Memory Setting	RO	Enable (1)

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-RMVM5C)	-	RO	-	3
0xAMMN:01	Unit Address Order	IO Module Assignment Direction	RO	byte	0x00: Mode1 0x01: Mode2
0xAMMN:01	ON/OFF Count Mode	Setting the Measurement Target for ON/OFF Time Measurement	R/W	byte	0x11: Input8ch/Output8ch 0x20: Input16ch
0xAMMN:01	Configuration Memory Setting	Configuration Storage Function	RO	byte	0x00: Disable 0x01: Enable

Remote Access

Using the CoE Object Dictionary, you can view configuration and diagnostic data, as well as read and write various parameters.

The following information is provided in the CoE table.

F802:0	Remote Access	RO	> 8 <
F802:01	Request	RW	Write (1)
F802:02	Wireless Channel	RW	0x01 (1)
F802:03	Unit	RW	0x04 (4)
F802:04	Channel	RW	0xFE (254)
F802:05	Number	RW	0x04 (4)
F802:06	Length	RW	0x01 (1)
F802:07	Data	RW	00 00 00 00 00 00 00 00...
F802:08	Fault Code	RO	0x00000000 (0)

Index	Name	Definition	Size	Value
0xF802:0	Remote	-	-	8
0xF802:01	Request	Read/Write Selection	byte	0x00: Read 0x01: Write
0xF802:02	Wireless Channel	Wireless Channel	byte	0x01-0x3F:1-63
0xF802:03	Unit	Unit No.＋1	byte	0x01-0x09、0x00
0xF802:04	channel	channel No.	byte	0x01-0x0F、0xFE
0xF802:05	Number	Parameter No.	byte	0x00 - 0xFF
0xF802:06	Length	Parameter Size	byte	0x00 - 0xFF
0xF802:07	Data	Read/Write Data	byte[]	0x00..00 - 0xFF..FF
0xF802:08	Fault Code	EtherCAT Fault code	USHORT	0xXXXXXXXX=EtherCAT error Code 0x00008023=IDX_NOT_ACCESSIBLE 0x000081E0=WCH_NOT_EXIST 0x000081E1=UNIT_NOT_CONFIG

If any of the values from 0xF802:02 to 0xF802:07 are changed, the changes will not take effect unless a read or write operation is performed on 0xF801:01.

● Remote EXW1-RMVM5C

Name	Definition	Flag	Wch	Unit	Ch	Num	Size	Value
Configured Unit List	Reading the configuration data stored during pairing	R/W	0x01 - 0x3F	0x00	0xFE	0x0C	10 byte	For details, refer to page 156
Connected Unit List	Reading the Current Configuration Data					0x0D	10 byte	For details, refer to page 156

● ON/OFF COUNT

Name	Definition	Flag	Wch	Unit	Ch	Num	Size	Value (Default)
Ch #: Timer Trigger	Measurement Start/End Channel and Trigger Settings	R/W	0x01 - 0x3F	0x01 - 0x09	0x00 - 0x0F	0x00	2 bytes	0x01-0x2F2E (refer to page225) ch: Timer Ch 0-15 For details, refer to page 231
Ch #: Upper Limit Detection Value	Upper Threshold Setting					0x01	2 bytes	0x00 – 0xFFFF： 0 - 65535 ms (0x00) ch: Timer Ch 0-15 For details, refer to page 231
Ch #: Lower Limit Detection Value	Lower Threshold Setting					0x02	2 bytes	0x00 – 0xFFFF： 0 - 65535 ms (0x00) ch: Timer Ch 0-15 For details, refer to page 231
Ch #: Notification set point	Sets the number of outside-of threshold range measurements to send notification					0x03	2 bytes	0x00 - 0xFFFF： 0 - 65535 counts (0x05) ch: Timer Ch 0-15 For details, refer to page 231
Latest value	Latest Measurement Time	RO			0xFE	0x00	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Average value	Average of the Last 8 Measurements					0x01	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Maximum value	Maximum Value Since Measurement Start					0x02	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Minimum value	Minimum Value Since Measurement Start					0x03	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Out of range	Number of Out-of-Threshold Measurements					0x04	32 bytes	0x00 - 0xFFFF： 0 - 65535 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
All count value	Total Number of Measurements					0x05	64 bytes	0x00 - 0xFFFFFFFF： 0 - 4294967295 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Ch #: Clear	Reset the latest, average, maximum and minimum values to 0	WO			0x00 - 0x0F	0x04	byte	Length:0x01、Data：0x01(Clear) Ch: Timer Ch 0-15
	Reset the latest, average, maximum and minimum values to 0						byte	Length:0x01、Data：0x0FF (All clear) Ch: Timer Ch 0-15
Ch 7-0: Exceeded specified Limit	Detects the upper limit of ON/OFFs	RO			0x00 - 0x07	0x05	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit7 … Bit0 Timer Ch7 … Timer Ch0
Ch 15-8: Exceeded specified Limit					0x08 - 0x0F		byte	0x00 – 0xFF 0: No diagnostics,1: Diagnostics enabled Bit7 … Bit0 Timer Ch15 … Timer Ch8

● Logger

Name	Definition	Flag	Wch	Unit	Ch	Num	Size	Value
Log 1 *1	Show 5 log entries	RO	0x01 - 0x3F	0x01 - 0x08	0x00 - 0x0F	0x00	120 bytes (24 bytes x Log No 5Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log Refer to page 232
:	:			:			:	:
Log 8 *1	Show 5 log entries			0x01 - 0x08	0x00 - 0x0F	0x07	120 bytes (24 bytes x Log No 5Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No - 35** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No – 36** : Byte48-49：**Log No – 37** : Byte72-73：**Log No – 38** : Byte96-97：**Log No – 39** : Byte112-119：Time stamp Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1：From each log (Log1–Log8), you can obtain 5 entries. Log1 represents the newest log, and Log8 the oldest.

Logger（continued）

Name	Definition	Flag	Wch	Unit	Ch	Num	Size	Value
Log *1	Timer Channel Logs	RO	0x01 - 0x3F	0x01 - 0x08	0x00 - 0x0F	0x0C	120 bytes (24 bytes x Log No 5Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log D [1]: Timer Ch No 0 – 15 Refer to page 232
Log Clear	Clear Logs for Each Timer Channel	WO			0xFE	0x04	byte	Length:0x01,Data：0x00-0xFF Any value can be used for the data.

Digital Input Module (EX600-DX#)

● Diags (EXW1-DXxB)、(EXW1-DXxC)、(EXW1-DXxC1)

Index	Name	Flags	Value	Unit
A000:0	Rem 1: Diags (EX600-DXxB)	RO	> 28 <	
A000:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A000:02	Ch 0: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A000:03	Ch 1: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A000:04	Ch 2: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A000:05	Ch 3: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A000:06	Ch 4: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A000:07	Ch 5: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-DXxB)	-	RO	-	28
	Rem #: Diags (EXW1-DXxC)	-	RO	-	28
	Rem #: Diags (EXW1-DXxC1)	-	RO	-	28
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	ON/OFF Operation Count Limit Detection	R/W	byte	0x00 - 0xFF (0x00) 0: Disable, 1: Enable Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02 : 0xAMMN:09	Ch # ON/OFF Counter Limit Value (1k-65000k)	Sets the ON/OFF count limit	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:0A : 0xAMMN:11	Ch # ON/OFF Counter Value	ON/OFF Number of Operations	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 Number of ON/OFF cycles per channel
0xAMMN:12 : 0xAMMN:19	Ch # ON/OFF Counter Clear	ON/OFF Clear Operation Count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0
0xAMMN:1A	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:1B	Ch 7-0: Open Circuit Detection	Detects an open circuit	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:1C	Ch 7-0: Short Circuit Detection (Input)	Power Supply Short Circuit Detection	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

● Diags (EXW1-DXxD)、(EXW1-DXxE)、(EXW1-DXxF)

Index	Name	Flags	Value	Unit
⊞ A000:0	Rem 1: Diags (EX600-DXxB)	RO	> 28 <	
⊟ A001:0	Rem 1: Diags (EX600-DXxD)	RO	> 56 <	
A001:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A001:02	Ch 15-8: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A001:03	Ch 0: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A001:04	Ch 1: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A001:05	Ch 2: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A001:06	Ch 3: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-DXxD)	-	RO	-	56
	Rem #: Diags (EXW1-DXxE)	-	RO	-	56
	Rem #: Diags (EXW1-DXx)	-	RO	-	56
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value	R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02	Ch 15-8: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:03 : 0xAMMN:12	Ch # ON/OFF Counter Limit Value (1k-65000k)	Setting the number of ON/OFF cycles	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:13 : 0xAMMN:22	Ch # ON/OFF Counter Value	ON/OFF Operation Count	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 Number of ON/OFF cycles per channel
0xAMMN:23 : 0xAMMN:32	Ch # ON/OFF Counter Clear	ON/OFF Clear operation count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0
0xAMMN:33	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:34	Ch 15-8: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:35	Ch 7-0: Open Circuit Detection	Detects an open circuit	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:36	Ch 15-8: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Diags (EXW1-DXxD)、(EXW1-DXxE)、(EXW1-DXxF) (continued)

Index	Name	Definition	Flag	Size	Value (Default)		
0xAMMN:37	Ch 7-0: Short Circuit Detection (Input)	Detects short circuits in output devices	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:38	Ch 15-8: Short Circuit Detection (Input)		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8

Digital Output Module (EX600-DY#)

● Diags (EXW1-DYxB)

Index	Name	Flags	Value	Unit
⊞ A001:0	Rem 1: Diags (EX600-DXxD)	RO	> 56 <	
⊟ A002:0	Rem 1: Diags (EX600-DYxB)	RO	> 28 <	
A002:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A002:02	Ch 0: Counter Limit Value(1k-65000k)	RW	0x0001 (1)	
A002:03	Ch 1: Counter Limit Value(1k-65000k)	RW	0x0001 (1)	
A002:04	Ch 2: Counter Limit Value(1k-65000k)	RW	0x0001 (1)	
A002:05	Ch 3: Counter Limit Value(1k-65000k)	RW	0x0001 (1)	

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-DYxB)	-	RO	-	28
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02 : 0xAMMN:09	Ch # ON/OFF Counter Limit Value (1k-65000k)	ON/OFF Counter Limit Value.	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:0A : 0xAMMN:11	Ch # ON/OFF Counter Value	ON/OFF Operation Count	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 Number of ON/OFF cycles per channel
0xAMMN:12 : 0xAMMN:19	Ch # ON/OFF Counter Clear	ON/OFF Clear operation count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0
0xAMMN:1A	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:1B	Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:1C	Ch 7-0: Short Circuit Detection (Input)	The short circuit of the power supply for the input device has been detected.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

● Diags (EXW1-DYxE)、(EXW1-DYxF)

Index	Name	Flags	Value	Unit
⊞ A002:0	Rem 1: Diags (EX600-DYxB)	RO	> 28 <	
⊟ A003:0	Rem 1: Diags (EX600-DYxE)	RO	> 56 <	
A003:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A003:02	Ch 15-8: ON/OFF Counter Limit Detection	RW	0x00 (0)	
A003:03	Ch 0: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A003:04	Ch 1: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	
A003:05	Ch 2: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)	

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-DXxE)	-	RO	-	56
	Rem #: Diags (EXW1-DXxF)	-	RO	-	56
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02	Ch 15-8: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:03 : 0xAMMN:12	Ch # ON/OFF Counter Limit Value (1k-65000k)	ON/OFF Counter Limit Value.	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:13 : 0xAMMN:22	Ch # ON/OFF Counter Value	ON/OFF Operation Count	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 ON/OFF Operation Count
0xAMMN:23 : 0xAMMN:32	Ch # ON/OFF Counter Clear	ON/OFF Clear operation count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0
0xAMMN:33	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:34	Ch 15-8: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:35	Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:36	Ch 15-8: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Diags (EXW1-DYxE)、(EXW1-DYxF) (continued)

Index	Name	Definition	Flag	Size	Value (Default)		
0xAMMN:37	Ch 7-0: Short Circuit Detection (Output)	The short circuit of the power supply for the input device has been detected.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:38	Ch 15-8: Short Circuit Detection (Output)		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8

Digital Input/Output Module (EX600-DM#)

● Diags (EXW1-DMxE)、(EXW1-DMxF)

Index	Name	Flags	Value
9000:0	Rem 1: Module Identification	RO	> 11 <
A000:0	Rem 1: Diags (EX600-DMxE)	RO	> 58 <
A000:01	Ch 7-0: ON/OFF Counter Limit Detection	RW	0x00 (0)
A000:02	Ch 15-8: ON/OFF Counter Limit Detection	RW	0x00 (0)
A000:03	Ch 0: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)
A000:04	Ch 1: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)
A000:05	Ch 2: Counter Limit Value(1k-65000k)	RW	0xFDE8 (65000)

Index	Name	Definition	Flag	Size	Value (Default)
0xAMMN:0	Rem #: Diags (EXW1-DMxE)	-	RO	-	58
	Rem #: Diags (EXW1-DMxF)	-	RO	-	58
0xAMMN:01	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:02	Ch 15-8: ON/OFF Counter Limit Detection		R/W	byte	0x00 - 0xFF (0x00) 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:03 : 0xAMMN:12	Ch # ON/OFF Counter Limit Value (1k-65000k)	ON/OFF Counter Limit Value.	R/W	2 bytes	0x01 – 0xFDE8: 1 – 65000 (0xFDE8) Number of operations [times] Set value × 1000
0xAMMN:13 : 0xAMMN:22	Ch # ON/OFF Counter Value	ON/OFF Operation Count	RO	4 bytes	0x00 - 0xFFFFFFFF : 0 - 429496729 ON/OFF Operation Count
0xAMMN:23 : 0xAMMN:32	Ch # ON/OFF Counter Clear	ON/OFF Clear operation count	WO	byte	0x00 - 0xFF (Any value is acceptable) Sets the ON/OFF operation count to 0
0xAMMN:33	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:34	Ch 15-8: Exceeded ON/OFF Counter Limit		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
0xAMMN:35	Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected.	RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
0xAMMN:36	Ch 15-8: Open Circuit Detection		RO	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Diags (EXW1-DMxE)、(EXW1-DMxF) (continued)

Index	Name	Definition	Flag	Size	Value (Default)		
0xAMMN:37	Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	RO	byte	0x00 - 0xFF		
					0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:38	Ch 15-8: Short Circuit Detection (Output)		RO	byte	0x00 - 0xFF		
					0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8
0xAMMN:39	Ch 7-0: Short Circuit Detection (Input)	Detects short circuits in Input devices	RO	byte	0x00 - 0xFF		
					0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch7	…	Ch0
0xAMMN:3A	Ch 15-8: Short Circuit Detection (Input)		RO	byte	0x00 - 0xFF		
					0: No diagnostics, 1: Diagnostics enabled		
					Bit7	…	Bit0
					Ch15	…	Ch8

Analog Input,Output,and I/O Modules(EX600-A#A)、(EX600-A#B)

● Diags (EXW1-AXA)、(EXW1-AXB)、(EXW1-AYA)、(EXW1-AMB)

Index	Name	Flags	Value
⊞ A000:0	Rem 1: Diags (EX600-DMxE)	RO	> 58 <
⊟ A001:0	Rem 1: Diags (EX600-AXA)	RO	> 5 <
A001:01	Ch 1-0: UserSettingValueLowerLimitError	RO	0x00 (0)
A001:02	Ch 1-0: UserSettingValueUpperLimitError	RO	0x00 (0)
A001:03	Ch 1-0: Under Range Detection	RO	0x00 (0)
A001:04	Ch 1-0: Over Range Detection	RO	0x00 (0)
A001:05	Ch 1-0: Short Circuit Detection(Input)	RO	0x00 (0)

Index	Name	Definition	Flag	Size	Value
0xAMMN:0	Rem #: Diags (E600-AXA)	-	RO	-	5
	Rem #: Diags (E600-AXB)	-	RO	-	5
	Rem #: Diags (E600-AYA)	-	RO	-	5
	Rem #: Diags (E600-AMB)	-	RO	-	5
0xAMMN:01	Ch #-0 User Setting Value Lower Limit Error	Lower Limit Error	RO	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit4-7 Bit3 Bit2 Bit1 Bit0 Reserved Ch3 Ch2 Ch1 Ch0
0xAMMN:02	Ch #-0 User Setting Value Upper Limit Error	Upper Limit Error	RO	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit4-7 Bit3 Bit2 Bit1 Bit0 Reserved Ch3 Ch2 Ch1 Ch0
0xAMMN:03	Ch #-0 Under Range Detection *1	Lower Range Limit Error Occurrence	RO	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit4-7 Bit3 Bit2 Bit1 Bit0 Reserved Ch3 Ch2 Ch1 Ch0
0xAMMN:04	Ch #-0 Over Range Detection *1	Range Upper Limit Error Occurrence	RO	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit4-7 Bit3 Bit2 Bit1 Bit0 Reserved Ch3 Ch2 Ch1 Ch0
0xAMMN:05	Ch #-0 Short Circuit Detection (Input)/(Output)	Short-Circuit Diagnosis for Input/Output Device Power Supplies	RO	byte	0x00 - 0xFF 0: No diagnostics,1: Diagnostics enabled Bit4-7 Bit3 Bit2 Bit1 Bit0 Reserved Ch3 Ch2 Ch1 Ch0

*1: Applies to analog input modules only. Channels connected to analog output modules are fixed at 0.

IO-Link Master Unit (EX600-L#B1)

● Params (EX600-LxB1 P1、P2、P3、P4)

Index	Name	Flags	Value
7009	Rem 1: Reserved (EXW1-RMVM5C Byte 0)	RO P	0x00 (0)
8003:0	Rem 1: Params (EX600-LxB1 P1)	RO	> 2 <
8003:01	Ch 0: Port Input IO-Link Size	RO	16byte (16)
8003:02	Ch 0: Port Output IO-Link Size	RO	16byte (16)

Index	Name	Definition	Flags	Value
0x8MMN:0	Rem #: Params (EX600-LxB1 P1)	-	-	2
	Rem #: Params (EX600-LxB1 P2)	-	-	2
	Rem #: Params (EX600-LxB1 P3)	-	-	2
	Rem #: Params (EX600-LxB1 P4)	-	-	2
0x8MMN:01	Ch 0:Port Input IO-Link Size	Read IO-Link Port Process Data Size	RO	0x00 – 0x20 0byte – 32byte
0x8MMN:02	Ch 0:Port Output IO-Link Siz	Read IO-Link Port Process Data Size	RO	0x00 – 0x20 0byte – 32byte

● Diags (EX600-LxB1 P1、P2、P3、P4)

Index	Name	Flags	Value
A001:0	Rem 1: Diags (EX600-AXA)	RO	> 5 <
A003:0	Rem 1: Diags (EX600-LxB1 P1)	RO	> 9 <
A003:01	Ch 0: PortStatusInfo	RO	NO_DEVICE (0)
A003:02	Ch 0: PortQualityInfo	RO	INVALID/PDOUTINVALI...
A003:03	Ch 0: RevisionID	RO	0x00 (0)
A003:04	Ch 0: TransmissionRate	RO	NOT_DETECTED (0)
A003:05	Ch 0: MasterCycleTime	RO	0x00 (0)
A003:06	Ch 0: InputDataLength	RO	0x00 (0)
A003:07	Ch 0: OutputDataLength	RO	0x00 (0)
A003:08	Ch 0: VendorID	RO	0x0000 (0)
A003:09	Ch 0: DeviceID	RO	0x00000000 (0)

Index	Name	Definition	Flags	Value
0xAMMN:0	Rem #: Diags (EX600-LxB1 P1)	-	-	9
	Rem #: Diags (EX600-LxB1 P2)	-	-	9
	Rem #: Diags (EX600-LxB1 P3)	-	-	9
	Rem #: Diags (EX600-LxB1 P4)	-	-	9
0xAMMN:01	Ch #:Port Status Info	Port Status Info	RO	0x00: NO_DEVICE 0x01: DEACTIVATED 0x02: PORT_DIAG 0x03: PREOPERATE 0x04: OPERATE 0x05: DI_C/Q 0x06: DO_C/Q
0xAMMN:02	Ch #:Port Quality Info	Port Quality Info	RO	0x00-0x03 0: Process Data Valid 1: Process Data Invalid Bit2-7 / Bit1 / Bit0 Fixed at 0 / Output / Input

Diag（EX600-LxB1 P1、P2、P3、P4) (continued)

Index	Name	Definition	Size	Value
0xAMMN:03	Ch #: Revision ID	Device IO-Link version	RO	0x00–0xFF
0xAMMN:04	Ch #:Transmission Rate	Communication Speed	RO	0x00: NOT_DETECTED 0x01:COM1 0x02:COM2 0x03:COM3
0xAMMN:05	Ch #:MasterCycle Time	Actual cycle time value	RO	0：As fast as possible 0x00-0x03：0.4 ms 0x04-0x3F：0.4 - 6.3 ms (0.1 ms intervals) 0x40-0x7F：6. - 31.6 ms (0.4 ms intervals) 0x80-0xBF：32 - 132.8 ms (1.6 ms intervals) 0xC0-0xFF：132.8 ms
0xAMMN:06	Ch #:Input Data Length	Process Input Data Length	RO	0-32byte
0xAMMN:07	Ch #:Output Data Length	Process Output Data Length	RO	0-32byte
0xAMMN:08	Ch #:Vendor ID	Vendor ID of the Connected IO-Link Device	RO	0-65535
0xAMMN:09	Ch #:Device ID	Device ID of the Connected IO-Link Device	RO	0-1677215

EtherNet/IP™

Please refer to the EXW1-BENAC1 instruction manual for information on how to connect it to a Rockwell Automation PLC.
For detailed operating procedures, refer to Rockwell Automation's manual.

When using Wireless Protocol V.2.0, use EtherNet/IP™ Explicit Message to check diagnostic data, read and write various parameters.

When using Wireless Protocol V.1.0, EtherNet/IP™ Explicit Message is not supported. For checking diagnostic data and reading and writing various parameters, please use the IO Configurator.

EtherNet/IP™object

EtherNet/IP™ Explicit Message can be used to check diagnostic data, and read and write various parameters.
The data format is shown below.

- Read：0x32
- Write：0x33

[Request]

Data	Value	Note
Service code	0x32 / 0x33	・Read：0x32 ・Write：0x33
Class	0x31A、0x39D	0x31A:EXW1-RMV#、0x39D: EXW1-RMV#(Valve Output)
	0x3A0、0x39B	0x3A0:ON/OFF COUNT、0x39B:Logging Data
	0x39C、0x39D、0x39E 0x39F、0x3A1	0x39C：EX600-DX#,0x39D:EX600-DY#,0x39E:EX600-DM 0x39F：EX600-A##,0x3A1：EX600-L#B
Instance	0x01～7F	Wireless channel
Attribute	0x64～83	Parameter No. *1
Data[0]	0x01～09	Unit No +1 *1
Data[1]	0x00～0F	Channel No
Data[2]～[n]	***	Write Data (For write operations only)

*1: For the values to be specified, refer to the parameters of each unit.

[Response]

Data	Value	Note
Ack[0]～[3]	0xB2000000/0xB3000000	Successfully reading 0xB2000000、 Successfully writing：0xB3000000 Refer to the CIP error codes.
Data[0]～[n]	***	Read data (For read operations only)

Each item is abbreviated as follows.
Class:Cla, Instance:Ins, Attribute:Att, Data[0]:D[0], Data[1]:D[1], Read only：Get,
Read or Write：Get/Set

The following are CIP error code.

-Reading

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service is not supported	0x08	
Path destination unknown	0x05	
Object instance does not exist	0x16	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

-Writing

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service not supported	0x08	
Path destination unknown	0x05	
Attribute not settable	0x0E	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

EXW1-RMV#M5C

● Remote Parameters **Class: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	Get/ Set	0x01 - 0x7F (Wireless Ch)	0x66	0x00	0x00	byte	0: Disable 1: Enable
Brown-out Detection for US1	US2 (for outputs) Power Supply Voltage Drop			0x67			byte	0: Disable 1: Enable
Output State Fieldbus FaultIdle	Specifies the output state when communication with the host is lost or during Idle mode			0x68			byte	0x00：Clear 0x01：Hold 0x02：Individual
Output State for RF Timeout	Output settings when wireless communication is lost (timeout)			0x69			byte	0x00：Clear 0x01：Hold 0x02：Individual
AD Update Time	Analog Update Time			0x6A			2 bytes	100-60000(500)
Byte Order of Analog Values	Endian Type (Analog Only)			0x6B			byte	0x00：LSB-MSB (Little Endian) 0x01：MSB-LSB (Big Endian)
Valve Output	Number of occupied points on the valve manifold			0x6C			byte	0x00：0 points 0x01：8 points 0x02：16 points 0x03：24 points 0x04：32 points
ON/OFF Count Mode	Setting the Measurement Target for ON/OFF Time Measurement			0x6E			byte	0x11: Input8ch/Output8ch 0x20: Input16ch

● Diagnostic Parameters Remote **Class: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Unit Address Order	IO Module Assignment Direction	Get	0x01 - 0x7F (Wireless Ch)	0x6D	0x00	0x00	byte	0x00：Mode1 0x01：Mode 2
Configuration Memory Mode	Configuration Storage Function			0x6F			byte	0: Disable 1: Enable
Configured Unit List	Reading the configuration data stored during pairing			0x70			10 bytes	For details, refer to page 156
Connected Unit List	Reading the Current Configuration Data			0x71			10 bytes	For details, refer to page 156

● Diagnostic Parameters Valve Output **Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67		0x00-0x0F	byte	0x01 - 0xFF (Reset with any non-zero value.) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	Generates error when the operation count exceeds the set value.	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Exceeded ON/OFF Counter Limit						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Exceeded ON/OFF Counter Limit						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
Ch 7-0: Open Circuit Detection	Detects an open circuit			0x69		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detection						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Open Circuit Detection						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Open Circuit Detection						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

Diagnostic Parameters Valve Output(continued) **Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	Get	0x01 - 0x7F (Wireless Ch	0x6A	0x01 - 0x08	0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Short Circuit Detection (Output)						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Short Circuit Detection (Output)						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

● Unit Parameters ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Ch #: Timer Trigger	Measurement Start/End Channel and Trigger Settings	Get/Set	0x01 - 0x7F (Wireless Ch	0x64	0x01 - 0x08	0x00 - 0x0F	2 bytes	0x01-0x2F2E (refer to page225) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Upper Limit Detection Value *1,*2	Upper Threshold Setting			0x65			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Lower Limit Detection Value *1,*2	Upper Threshold Setting			0x66			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Notification set point *1	Sets the number of outside-of threshold range measurements to send notification			0x67			2 bytes	0x00 - 0xFFFF : 0 - 65535 回 (0x05) D[1]: Timer Ch 0-15 For details, refer to page 231

*1: A value of 0 disables the setting. For details, refer to "Log Function and Notification Function" (page 223).
*2: Configure the threshold values so that the upper threshold is greater than the lower threshold.

● Diagnostic Parameters　ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Latest value *1	Latest Measurement Time	Get	0x01 - 0x7F (Wireless Ch	0x68	0x01 - 0x08	0x00	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Average value *1	Average of the Last 8 Measurements			0x69			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Maximum value *1	Maximum Value Since Measurement Start			0x6A			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Minimum value *1	Minimum Value Since Measurement Start			0x6B			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Out of range *2	Number of Out-of-Threshold Measurements			0x6C			32 bytes	0x00 - 0xFFFF： 0 - 65535 回 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
All count value *3	Total Number of Measurements			0x6D			64 bytes	0x00 - 0xFFFFFFFF： 0 - 4294967295 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Ch #: Clear	Reset the latest, average, maximum and minimum values to 0	Set		0x6E		0x00 - 0x0F	byte	0x01 (Clear) D[1]: Timer Ch 0-15
	Reset the latest, average, maximum and minimum values to 0						byte	0x0FF (All clear) D[1]: Timer Ch 0-15
Ch 7-0: Exceeded specified Limit *4	Detects the upper limit of ON/OFFs	Get		0x6F		0x00	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch7 … Timer Ch0
Ch 15-8: Exceeded specified Limit *4						0x08	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch15 … Timer Ch8

*1: The value is 0 if the ON/OFF Time Measurement Function has not been performed. For details, refer to "Acquired Data" (page 228).
*2: This value is obtained when the threshold setting is enabled (non-zero) and the measured value is outside the threshold range.
For details, refer to "Log Function and Notification Function" (page 223).
*3: For details, refer to "Acquired Data" (page 228).
*4: When the Notification Function is enabled, a diagnostic event is detected when the specified count is exceeded.

● Diagnostic Parameters　Logger　**Class: 0x039B**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Log 1 *1	Show 5 log entries	Get	0x01 - 0x7F (Wireless Ch	0x68	0x01 - 0x7F	0x00	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log Refer to page 232
:	:			:			:	:
Log 8 *1	Show 5 log entries			0x6F			120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No - 35** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No – 36** : Byte48-49：**Log No – 37** : Byte72-73：**Log No – 38** : Byte96-97：**Log No – 39** : Byte112-119：Time stamp Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1：From each log (Log1–Log8), you can obtain 5 entries. Log1 represents the newest log, and Log8 the oldest.

Diagnostic Parameters　Logger(continued)　**Class: 0x039B**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Log *1	Timer Channel Logs	Get	0x01 - 0x7F (Wireless Ch)	0x74	0x01 - 0x0F	0x00 - 0x0F	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF 詳細 Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log D [1]: Timer Ch No 0 – 15 Refer to page 232
Log Clear	Clear Logs for Each Timer Channel	Set		0x83		0x00	byte	0x01 – 0xFF (Any value can be used for the data.)

*1: Logs for each Timer Channel No. can be retrieved. Up to five logs are stored for each Timer Channel No.

Digital Input Module (EX600-DX#)

● Diagnostic Parameters Digital Input **Class: 0x039C**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Number of Operations	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00 - 0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear Operation Count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Open Circuit Detected	ON/OFF Operation Count Limit Detection			0x69		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detected						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Short Circuit Detection (Input)	ON/OFF Operation Count Limit Detection			0x6A		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Short Circuit Detection (Input)						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Digital Output Module (EX600-DY#)

● Diagnostic Parameters　Digital Output　**Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00- 0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x01 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected.			0x69		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detection						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Short Circuit Detection (Output)	The short circuit of the power supply for the input device has been detected.	Get		0x6A		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Digital Input/Output Module (EX600-DM#)

● Diagnostic Parameters　Digital Input/Output **Class: 0x039E**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x07	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch7
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch7
Ch 7-0: Exceeded ON/OFF Counter Limit *Input Unit	ON/OFF count value of input has exceeded the set value	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Exceeded ON/OFF Counter Limit *Output Unit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Open Circuit Detection *Output Unit	The open circuit of the output device has been detected			0x69		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (OUTPUT)	Detects short circuits in output devices			0x6A		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (INPUT)	Detects short circuits in Input devices			0x6B		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

Analog Input,Output,and I/O Modules (EX600-A#B)

● Diagnostic Parameters　Analog Unit **Class: 0x039F**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
User Setting Value Lower Limit Error	Lower Limit Error	Get	0x01 - 0x7F (Wireless Ch)	0x64	0x01 - 0x08	0x00-0x03	byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
User Setting Value Upper Limit Error	Upper Limit Error			0x65			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Under Range Detection	Lower Range Limit Error Occurrence			0x66			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Over Range Detection	Range Upper Limit Error Occurrence			0x67			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Short Circuit Detection	Short-Circuit Diagnosis for Input/Output Device Power Supplies			0x68			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0

IO-Link Master Unit (EX600-L#B1)

● Unit Parameters　IO-Link Master Unit **Class: 0x03A1**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Input data size for IOL	Set the Process Data Size Setting	Get/ Set	0x01- 0x7F (Wireless Ch)	0x64	0x02 - 0x05	0x00	byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte
Output data size for IOL	Set the Process Data Size Setting			0x65			byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte

● Diagnostic Parameters　IO-Link Master **Class: 0x03A1**

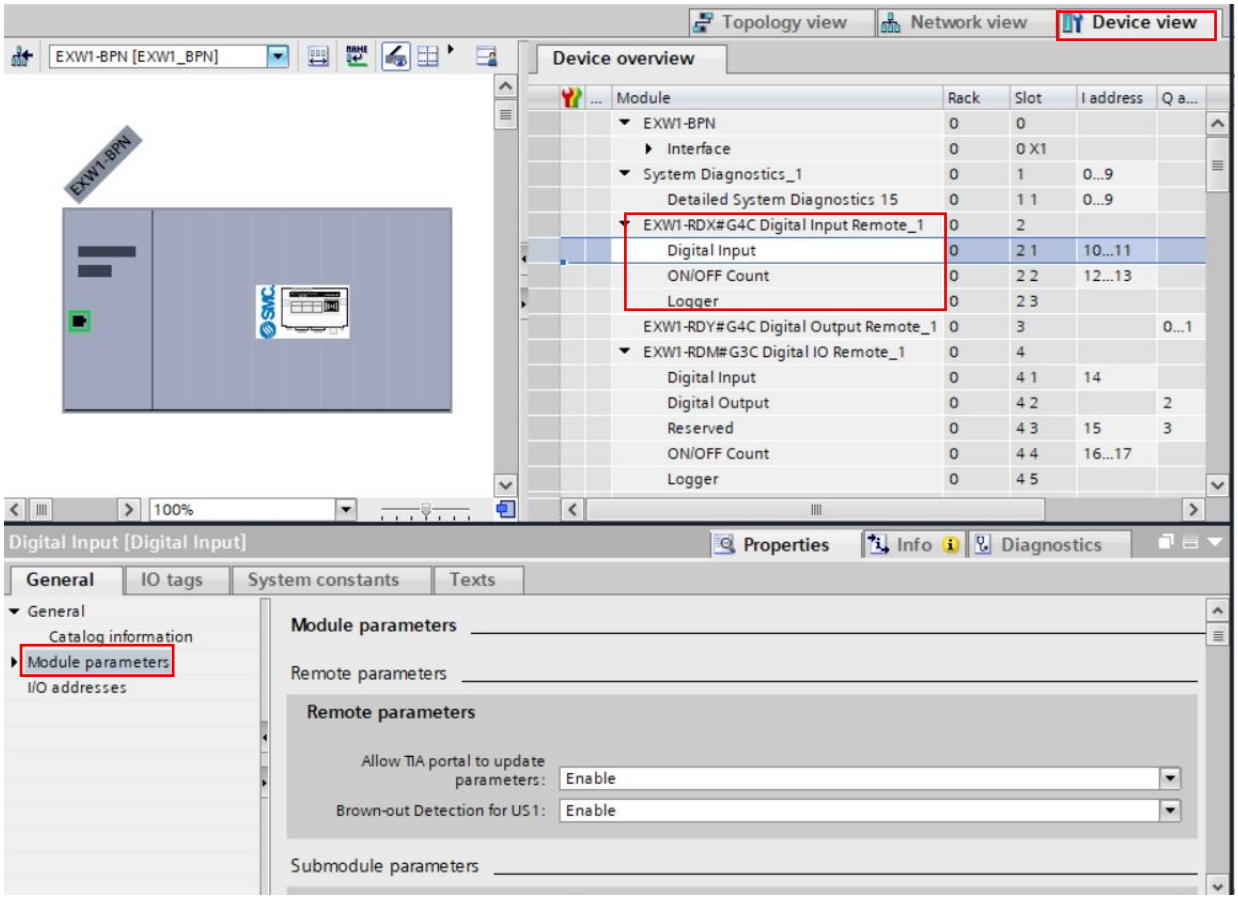
Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
IO-Link PortStatusInfo	Port Status Info	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x02 - 0x05	0x00	byte	0x00:NO_DEVICE 0x01:DEACTIVATED 0x02:PORT_DIAG 0x03:PREOPERATE 0x04:OPERATE 0x05:DI_C/Q 0x06:DO_C/Q
IO-Link PortQualityInfo	Port Quality Info			0x67			byte	Bit2-7 / Bit1 / bit0 Reserve / Output / Input 0x00 : valid/PDOUTvalid 0x01 : invalid/PDOUTvalid 0x02 : valid/PDOUTinvalid 0x03 : invalid/PDOUTinvalid
IO-Link Revision ID	Device IO-Link version			0x68			byte	0x00-0xFF:0-255
IO-Link Transmission rate	Communication Speed			0x69			byte	0x00 : NOT_DETECTED 0x01 : COM1 0x02 : COM2 0x03 : COM3
IO-Link Master Cycle Time	Actual cycle time value			0x6A			byte	0x00-0xFF:0-255
IO-Link Input Data Length	Process Input Data Length			0x6B			byte	0x00-0xFF:0-32
IO-Link Output Data Length	Process Output Data Length			0x6C			byte	0x00-0xFF:0-32
IO-Link Vendor ID	Vendor ID of the Connected IO-Link Device			0x6D			2 bytes	0x00-0xFFFF:0-65535
IO-Link Device ID	Device ID of the Connected IO-Link Device			0x6E			3 bytes	0x00-0xFFFFFF : 0–1677215

PROFINET

Please refer to the EXW1-BPNAC1 instruction manual for information on how to connect it to a SIEMENS PLC. For detailed operating procedures, refer to SIEMENS's manual.
*: The fpllowing is TIA PORTAL V18 on SIEMENS.

When using Wireless Protocol V.2.0, use GSDML file and asynchronous communication to configure the module parameters.
The following screen shows the configuration of EXW1-RL in SIEMENS software TIA Portal V18.
Please check the module parameters for each module, including acyclic communication and detailed module parameter information.

When using Wireless Protocol V.1.0, GSDML file and asynchronous communication are not supported.
Please use the IO Configurator to change the parameters.



●Allow TIA portal to update parameters
Some modules may have the option 'Allow TIA Portal to update parameters. This parameter determines whether the module parameters are overwritten when PROFINET communication is re-established (including power ON/OFF).
To change parameters via the asynchronous communication described later and do not want those parameters to be overwritten when PROFINET communication is re-established (including power ON/OFF), set this option to Disable.
If set to Enable, the parameters will be overwritten with the predefined values when PROFINET communication is re-established (including power ON/OFF).

Asynchronous communication

Asynchronous communication can be used to check diagnostic data, and read and write various parameters.
The support command format is shown below.

・Diagnostics information

Slot	SubSlot	Index	Type	Name	Len	Value
Target remote	Any	0x3FFF	R	Diagnostics	4 bytes	Wireless base system diagnostic 1-4

Each item is abbreviated as follows.
Slot: Slot、Sub:Sub Slot、InH:Index Hi byte、InL:Index Low byte、
R/W：Read/ Write(Read or write)、R: Read only

Module parameters

Below are the module parameters for each module and the data used in asynchronous communication.
Modules [ON/OFF Count] and [Logger] do not have any parameters that can be set via module parameters or asynchronous communication.

EXW1-RMV#M5C

Remote parameters

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Allow TIA portal to update parameters[*1]	Overwrite when PROFINET communication is re-established	-	-	-	-	-	-	Disable Enable
2	Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	Get/ Set	target remote	0x01	0x00	0x03	byte	0x00: Disable 0x01: Enable
3	Brown-out Detection for US1	US2 (for outputs) Power Supply Voltage Drop					0x04	byte	0x00: Disable 0x01: Enable
4	Output State Fieldbus FaultIdle	Specifies the output state when communication with the host is lost or during Idle mode					0x05	byte	0x00：Clear 0x01：Hold 0x02：Individual
5	Output State for RF Timeout	Output settings when wireless communication is lost (timeout)					0x06	byte	0x00：Clear 0x01：Hold 0x02：Individual
6	AD Update Time	Analog Update Time					0x07	2 bytes	100-60000(500)
7	Byte Order of Analog Values	Endian Type (Analog Only)					0x08	byte	0x00：LSB-MSB(Little Endian) 0x01：MSB-LSB(Big Endian)
8	Valve Output	Number of occupied points on the valve manifold					0x09	byte	0x00：0 points 0x01：8 points 0x02：16 points 0x03：24 points 0x04：32 points

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
9	Unit Address Order	IO Module Assignment Direction	Get	target remote	0x01	0x00	0x0A	byte	0x00 : Mode1 0x01 : Mode 2
10	ON/OFF Count Mode	Setting the Measurement Target for ON/OFF Time Measurement					0x0B	byte	0x11: Input8ch/Output8ch 0x20: Input
11	Configuration Memory Mode	Configuration Storage Function					0x0C	byte	0: Disable 1: Enable
12	Configured Unit List	Reading the configuration data stored during pairing					0x0D	10 bytes	For details, refer to page 156
13	Connected Unit List	Reading the Current Configuration Data					0x0E	10 bytes	For details, refer to page 156

Submodule parameters (Digital Output)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Allow TIA portal to update parameters*1	Overwrite when PROFINET communication is re-established	-	-	-	-	-	-	Disable Enable
2	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	RW	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00 – 0xFF (0x00) 0: Disable、1: Enable Bit7 … Bit0 Ch7 … Ch0
3	Ch 15-8: ON/OFF Counter Limit Detection						0x01	byte	0x00 – 0xFF (0x00) 0: Disable、1: Enable Bit7 … Bit0 Ch15 … Ch8
4	Ch 23-16: ON/OFF Counter Limit Detection						0x02	byte	0x00 – 0xFF (0x00) 0: Disable、1: Enable Bit7 … Bit0 Ch23 … Ch16
5	Ch 31-23: ON/OFF Counter Limit Detection						0x03	byte	0x00 – 0xFF (0x00) 0: Disable、1: Enable Bit7 … Bit0 Ch31 … Ch24
6	Counter Limit Value (1k-65000k)	Setting the number of ON/OFF cycles				0x20	0x00 - 0x1F	2 bytes	0x01 - 0xFDE8 : 1 - 65000 (0xFDE8) InL: Ch0-Ch31
7	ON/OFF Counter Value	ON/OFF Operation Count	R			0x30	0x00 - 0x1F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 InL: Ch0-Ch15
8	ON/OFF Counter Value Reset	ON/OFF Clear operation count	W			0x40	0x00 - 0x1F	byte	0x00 - 0xFF (Reset with any non-zero value.) InL: Ch0-Ch15

Submodule parameters (Digital Output) (continued)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
9	Ch 7-0: Exceeded ON/OFF Counter Limit	Generates error when the operation count exceeds the set value.	R	target remote	0x01 - 0x09 (Unit No+2)	0x05	0x00	byte	0x00 – 0xFF 0: No diagnostics, Bit7 … Bit0 Ch7 … Ch0
10	Ch 15-8: Exceeded ON/OFF Counter Limit						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
11	Ch 23-16: Exceeded ON/OFF Counter Limit						0x02	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
12	Ch 31-23: Exceeded ON/OFF Counter Limit						0x03	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
13	Ch 7-0: Open Circuit Detection*3	Detects an open circuit				0x06	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
14	Ch 15-8: Open Circuit Detection*3						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
15	Ch 23-16: Open Circuit Detection*3						0x02	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
16	Ch 31-24: Open Circuit Detection*3						0x03	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

Submodule parameters (Digital Output) (continued)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)		
17	Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	R	target remote	0x01 - 0x09 (Unit No+2)	0x07	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Ch7	…	Ch0
18	Ch 15-8: Short Circuit Detection (Output)						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Ch15	…	Ch8
19	Ch 23-16: Short Circuit Detection (Output)						0x02	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Ch23	…	Ch16
20	Ch 31-24: Short Circuit Detection (Output)						0x03	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Ch31	…	Ch24

Submodule parameters (ON/OFF Count)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Ch #: Timer Trigger	Measurement Start/End Channel and Trigger Settings	R/W	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00- 0x0F	2 bytes	0x01-0x2F2E (refer to page225) InL: Timer Ch 0-15 For details, refer to page 231
2	Ch #: Upper Limit Detection Value*1	Upper Threshold Setting				0x02		2 bytes	0x00 – 0xFFFF： 0 - 65535 ms (0x00) InL: Timer Ch 0-15 For details, refer to page 231
3	Ch #: Lower Limit Detection Value*1	Upper Threshold Setting				0x03		2 bytes	0x00 – 0xFFFF： 0 - 65535 ms (0x00) InL: Timer Ch 0-15 For details, refer to page 231
4	Ch #: Notification set point*1*2	Sets the number of outside-of threshold range measurements to send notificatio				0x04		2 bytes	0x00 - 0xFFFF： 0 - 65535 (0x05) InL: Timer Ch 0-15 For details, refer to page 231
5	Latest value*1	Latest Measurement Time	R			0x05	0x00	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
6	Average value*1	Average of the Last 8 Measurements				0x06		32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
7	Maximum value*1	Maximum Value Since Measurement Start				0x07		32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
8	Minimum value*1	Minimum Value Since Measurement Start				0x08		32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
9	Out of range*2	Number of Out-of-Threshold Measurements				0x09		32 bytes	0x00 - 0xFFFF： 0 - 65535 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
10	All count value*3	Total Number of Measurements				0x0A		64 bytes	0x00 - 0xFFFFFFFF： 0 - 4294967295 回 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
11	Ch #: Clear	Reset the latest, average, maximum and minimum values to 0	W			0x0B	0x00- 0x0F	byte	0x01 (Clear) InL: Timer Ch 0-15
		Reset the latest, average, maximum and minimum values number of measurements outside the threshold, and total number of measurements to 0						byte	0xFF (All clear) InL: Timer Ch 0-15

Submodule parameters (ON/OFF Count) (continued)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)		
12	Ch 7-0: Exceeded specified Limit	Detects the upper limit of ON/OFFs	R	target remote	0x01 - 0x09 (Unit No+2	0x0C	0x00	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Timer Ch7	…	Timer Ch0
	Ch 15-8: Exceeded specified Limit						0x08	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Timer Ch15	…	Timer Ch8

Submodule parameters (Logger)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value
1	Log 1[*1]	Show 5 log entries	R	target remote	0x01 - 0x09 (Unit No+2)	0x05	0x00	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-5：Measured value Byte6-7: Out of range times Byte8-11：All measured times Byte12-15：Reserved Byte16-23：Time stamp Byte24-25：**Log No - 1** ： Byte48-49：**Log No - 2** ： Byte72-73：**Log No - 3** ： Byte96-97：**Log No - 4** ： Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log Refer to page 232。
:	:	:				:		:	:
8	Log 8[*1]	Show 5 log entries				0x0C		120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No - 35** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No – 36** ： Byte48-49：**Log No – 37** ： Byte72-73：**Log No – 38** ： Byte96-97：**Log No – 39** ： Byte112-119：Time stamp Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1：From each log (Log1–Log8), you can obtain 5 entries. Log1 represents the newest log, and Log8 the oldest.

Submodule parameters (Logger)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value
9	Log*1	Show logs per timer channel	R	target remote	0x05	0x11	0x00 - 0x0F	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF
									Byte0-1 : **Log No** Byte2 : Timer Ch Byte3 : Reserved Byte4-5 : Measured value Byte6-7: Out of range times Byte8-11 : All measured times Byte12-15 : Reserved Byte16-23 : Time stamp Byte24-25 : **Log No - 1** : Byte48-49 : **Log No - 2** : Byte72-73 : **Log No - 3** : Byte96-97 : **Log No - 4** : Byte112-119 : Time stamp
									Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1: Logs for each Timer Channel No. can be retrieved. Up to five logs are stored for each Timer Channel No.

Digital Input Module (EX600-DX#)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Ch 7-0: ON/OFF Counter Limit Detection	ON/OFF Operation Count Limit Detection	R/W	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00 - 0xFF 0: Disable、1: Enable Bit7 … Bit0 Ch7 … Ch0
2	Ch 15-8: ON/OFF Counter Limit Detection						0x01	byte	0x00 - 0xFF 0: Disable、1: Enable Bit7 … Bit0 Ch15 … Ch8
3	Counter Limit Value (1k-65000k)	Sets the ON/OFF count limit				0x02	0x00 -0x0F	byte	0x01 - 0xFDE8 : 1 - 65000 (0xFDE8) InL: Ch0-Ch31
4	ON/OFF Counter Value	ON/OFF Number of Operations				0x03	0x00 -0x0F	byte	0x00 - 0xFFFFFFFF : 0 - 4294967295 InL: Ch0-Ch15
5	ON/OFF Counter Value Reset	ON/OFF Clear Operation Count				0x04	0x00 -0x0F	byte	0x00 - 0xFF (Any value is acceptable) InL: Ch0-Ch15
6	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	R			0x05	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch7 … Ch0
7	Ch 15-8: Exceeded ON/OFF Counter Limit						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch15 … Ch8
8	Ch 7-0: Open Circuit Detection*3	Detects an open circuit				0x06	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
9	Ch 15-8: Open Circuit Detection*3						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
10	Ch 7-0: Short Circuit Detection (Input)	Power Supply Short Circuit Detection				0x07	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch7 … Ch0
11	Ch 15-8: Short Circuit Detection (Input)						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch15 … Ch8

Digital Output Module (EX600-DY#)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Ch 7-0: ON/OFF Counter Limit Detection	Generates error when the operation count exceeds the set value.	R/W	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00 - 0xFF 0: Disable、1: Enable Bit7 … Bit0 Ch7 … Ch0
2	Ch 15-8: ON/OFF Counter Limit Detection						0x01	byte	0x00 - 0xFF 0: Disable、1: Enable Bit7 … Bit0 Ch15 … Ch8
3	Counter Limit Value (1k-65000k)	Setting the number of ON/OFF cycles				0x02	0x00 -0x0F	byte	0x01 - 0xFDE8：1 - 65000 (0xFDE8) InL: Ch0-Ch31
4	ON/OFF Counter Value	ON/OFF Clear operation count				0x03	0x00 -0x0F	byte	0x00 - 0xFFFFFFFF： 0 - 4294967295 InL: Ch0-Ch15
5	ON/OFF Counter Value Reset	ON/OFF Clear operation count				0x04	0x00 -0x0F	byte	0x00 - 0xFF(Any value is acceptable) InL: Ch0-Ch15
6	Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	R			0x05	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch7 … Ch0
7	Ch 15-8: Exceeded ON/OFF Counter Limit						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch15 … Ch8
8	Ch 7-0: Open Circuit Detection*3	Detects an open circuit				0x06	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
9	Ch 15-8: Open Circuit Detection*3						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
10	Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices				0x07	0x00	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch7 … Ch0
11	Ch 15-8: Short Circuit Detection (Output)						0x01	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit7 Ch15 … Ch8

Digital Input/Output Module (EX600-DM#)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)		
1	Ch 7-0: ON/OFFCounter Limit Detection *Input unit	Generates error when the operation count exceeds the set value.	R/W	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00 - 0xFF		
									0:Disable、1: Enable		
									Bit7	…	Bit0
									Ch7	…	Ch0
2	Ch 7-0: ON/OFF Counter Limit Detection *Output unit						0x01	byte	0x00 - 0xFF		
									0:Disable、1: Enable		
									Bit7	…	Bit0
									Ch15	…	Ch8
3	Counter Limit Value (1k-65000k)	ON/OFF Counter Limit Value.				0x02	0x00 - 0x0F	2 bytes	0x01 - 0xFDE8：1 - 65000 (0xFDE8)		
									InL: Ch0-Ch31		
4	ON/OFF Counter Value	ON/OFF Operation Count				0x03	0x00 - 0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295		
									InL: Ch0-Ch15		
5	ON/OFF Counter Value Reset	ON/OFF Clear operation count				0x04	0x00 - 0x0F	byte	0x00 - 0xFF(Any value is acceptable)		
									InL: Ch0-Ch15		
6	Ch 7-0: Exceeded ON/OFF Counter Limit *Input unit	ON/OFF count value of input has exceeded the set value.	R			0x05	0x00	byte	0x00 – 0xFF		
									0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit7
									Ch7	…	Ch0
7	Ch 15-8: Exceeded ON/OFF Counter Limit *Output unit						0x01	byte	0x00 – 0xFF		
									0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit7
									Ch15	…	Ch8
8	Ch 7-0: Open Circuit Detection*3 *Output unit	The open circuit of the output device has been detected				0x06	0x01	byte	0x00 – 0xFF		
									0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit0
									Ch15	…	Ch8
9	Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in Input or Output devices				0x07	0x00	byte	0x00 – 0xFF		
									0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit7
									Ch7	…	Ch0
10	Ch 15-8: Short Circuit Detection (Input)					0x08	0x00	byte	0x00 – 0xFF		
									0: No diagnostics, 1: Diagnostics enabled		
									Bit7	…	Bit7
									Ch15	…	Ch8

Analog Input,Output,and I/O Modules (EX600-A#B)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)				
1	User Setting Value Lower Limit Error	Lower Limit Error	R	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00 - 0xFF				
									0: No diagnostics,1: Diagnostics enabled				
									Bit4-7	Bit3	Bit2	Bit1	Bit0
									Reserved	Ch3	Ch2	Ch1	Ch0
2	User Setting Value Upper Limit Error	Upper Limit Error				0x02	0x00	byte	0x00 - 0xFF				
									0: No diagnostics,1: Diagnostics enabled				
									Bit4-7	Bit3	Bit2	Bit1	Bit0
									Reserved	Ch3	Ch2	Ch1	Ch0
3	Under Range Detection	Lower Range Limit Error Occurrence				0x03	0x00	byte	0x00 - 0xFF				
									0: No diagnostics,1: Diagnostics enabled				
									Bit4-7	Bit3	Bit2	Bit1	Bit0
									Reserved	Ch3	Ch2	Ch1	Ch0
4	Over Range Detection	Range Upper Limit Error Occurrence				0x04	0x00	byte	0x00 - 0xFF				
									0: No diagnostics,1: Diagnostics enabled				
									Bit4-7	Bit3	Bit2	Bit1	Bit0
									Reserved	Ch3	Ch2	Ch1	Ch0
5	Short Circuit Detection	Short-Circuit Diagnosis for Input/Output Device Power				0x05	0x00	byte	0x00 - 0xFF				
									0: No diagnostics,1: Diagnostics enabled				
									Bit4-7	Bit3	Bit2	Bit1	Bit0
									Reserved	Ch3	Ch2	Ch1	Ch0

IO-Link Master Unit (EX600-L#B1)

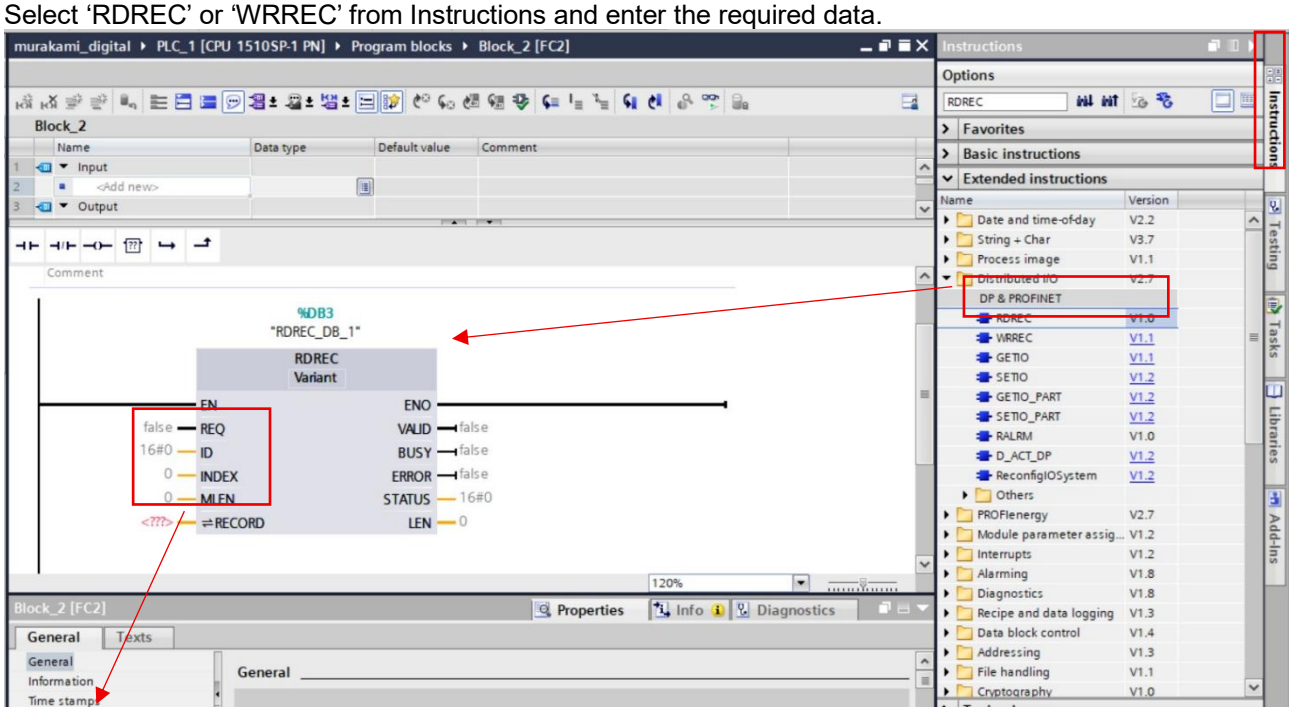
No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value (Default)
1	Input data size for IOL	Set the Process Data Size Setting	RW	target remote	0x01 - 0x09 (Unit No+2)	0x01	0x00	byte	0x00：0byte 0x01：2byte 0x02：4byte 0x08：8 byte 0x10：16byte 0x20：32byte
2	Output data size for IOL	Set the Process Data Size Setting				0x02	0x00	byte	0x00：0byte 0x01：2byte 0x02：4byte 0x08：8 byte 0x10：16byte 0x20：32byte
3	IO-Link PortStatusInfo	Port Status Info	R			0x03	0x00	byte	0x00:NO_DEVICE 0x01:DEACTIVATED 0x02:PORT_DIAG 0x03:PREOPERATE 0x04:OPERATE 0x05:DI_C/Q 0x06:DO_C/Q
4	IO-Link PortQualityInfo	Port Quality Info				0x04	0x00	byte	Bit2-7 Reserved / Bit1 Output / bit0 Input 0x00：valid/PDOUTvalid 0x01：invalid/PDOUTvalid 0x02：valid/PDOUTinvalid 0x03：invalid/PDOUTinvalid
5	IO-Link Revision ID	Device IO-Link version				0x05	0x00	byte	0x00-0xFF:0-255
6	IO-Link Transmission rate	Communication Speed				0x06	0x00	byte	0x00：NOT_DETECTED 0x01：COM1 0x02：COM2 0x03：COM3
7	IO-Link Master Cycle Time	Actual cycle time value				0x07	0x00	byte	0x00-0xFF:0-255
8	IO-Link Input Data Length	Process Input Data Length				0x08	0x00	byte	0x00-0xFF:0-32
9	IO-Link Output Data Length	Process Output Data Length				0x09	0x00	byte	0x00-0xFF:0-32
10	IO-Link Vendor ID	Vendor ID of the Connected IO-Link Device				0x0A	0x00	2 bytes	0x00-0xFFFF:0-65535
11	IO-Link Device ID	Device ID of the Connected IO-Link Device				0x0B	0x00	3 bytes	0x00-0xFFFFFF：0–1677215

Changing settings via asynchronous communication using a DB

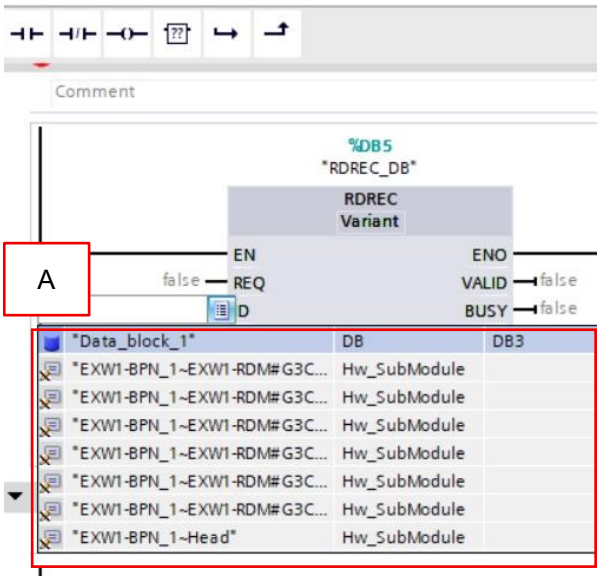
This section describes how to check diagnostic data and read/write various parameters using acyclic communication. For detailed operating procedures, please refer to the SIEMENS manual.

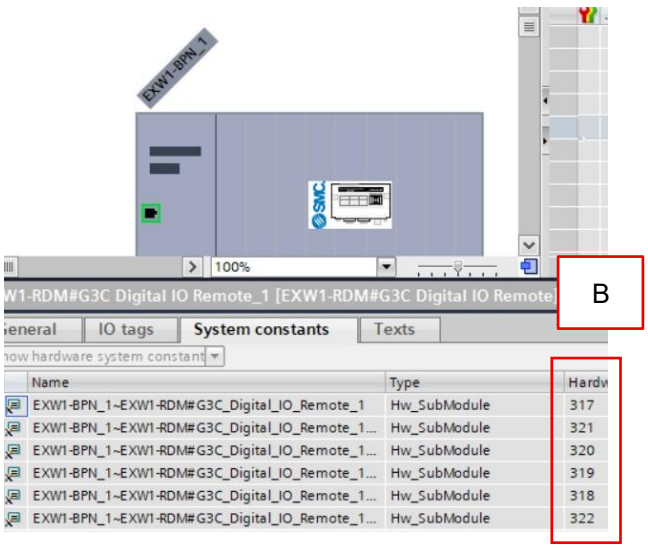
＜Reading or Writing Parameters Using DB＞

Select ‘RDREC’ or ‘WRREC’ from Instructions and enter the required data.



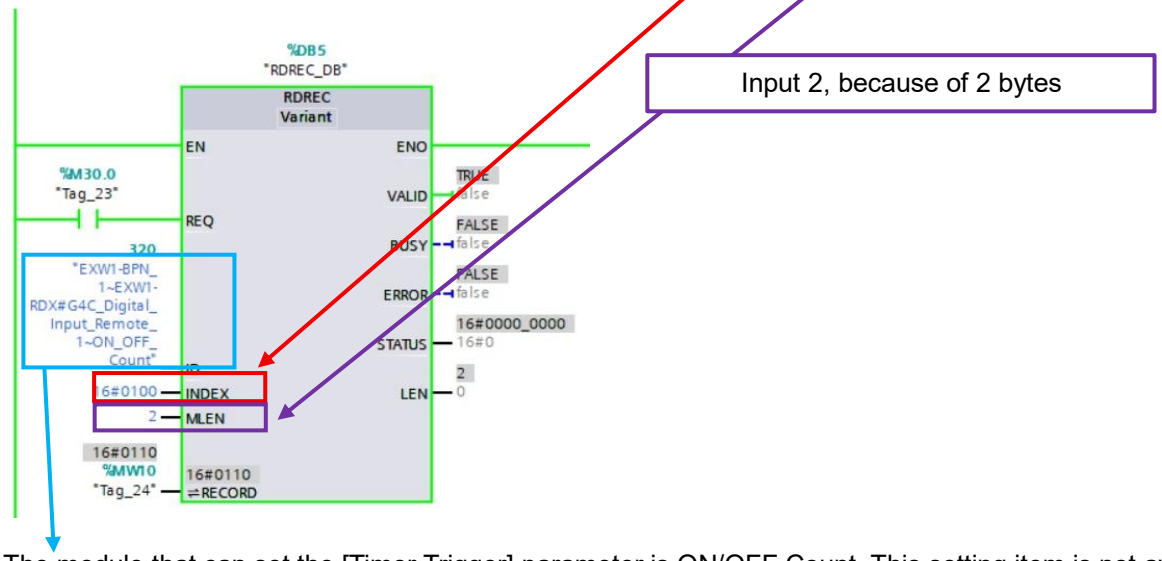
Name	Detail
ID	Select the module for the parameter to be read or written. Click on the ID and select the module directly (see section A in the figure), or enter the value of the Hardware Identifier from the Device view directly (see section B in the figure).
INDEX	Input InH: Index Hi byte and InL: Index Low byte
MLEN	Input bytes size of reading or writing
RECORD	Input the data of monitor or writing



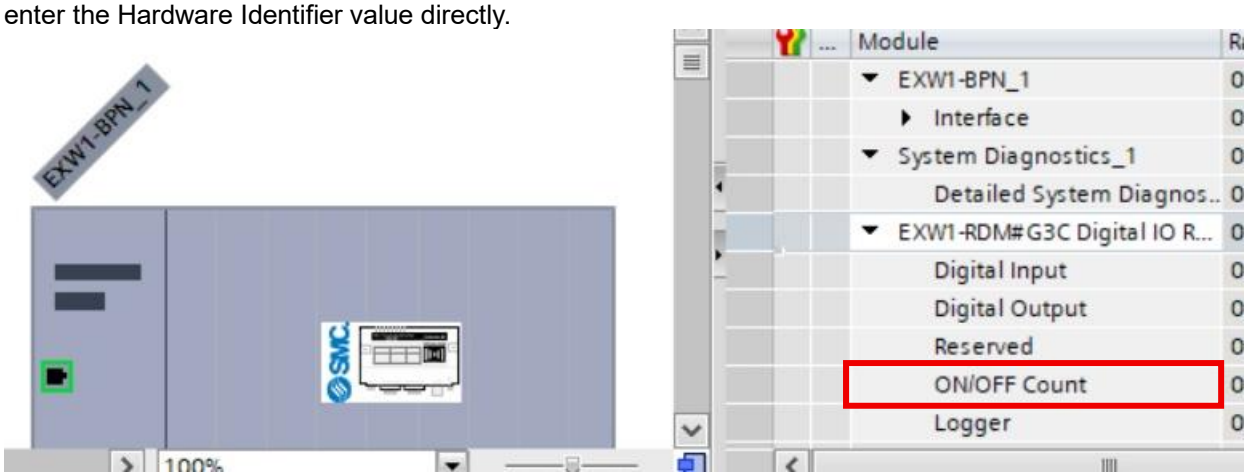


The figure below shows an example of reading the [Timer Trigger] using acyclic communication. ・Remote Parameters (Excerpt)

No.	Name	Definition	Type	Slot	Sub	InH	InL	Size	Value
1	Ch #: Timer Trigger	Start/end of measurement Ch, Sets a trigger	R/W	Target remote	0x02	0x01	0x00-0x0F	2 bytes	0x01-0x2F2E (refer to page225) InL: Timer Ch 0-15 For details, refer to page 231



The module that can set the [Timer Trigger] parameter is ON/OFF Count. This setting item is not available in the Module Parameters, so please configure it using the database (DB). You can either select the module or enter the Hardware Identifier value directly.



By applying any desired signal to REQ, the value of Timer Trigger is displayed in RECORD.

RECORD value: 16#0110
In hexadecimal notation, the value is displayed as 0110. The initial value for Timer Ch 0 is 0110.
For details, refer to page 233

DeviceNet®

When using Wireless Protocol V.2.0, use DeviceNet® Explicit Message to check diagnostic data, read and write various parameters.

When using Wireless Protocol V.1.0, use DeviceNet® Explicit Message is not supported. For checking diagnostic data and reading and writing various parameters, please use the IO Configurator.

DeviceNet® object

DeviceNet® Explicit Message can be used to check diagnostic data, and read and write various parameters. The data format is shown below.

- Read ：0x32
- Write ：0x33

[Request]

Data	Value	Note
Service code	0x32 / 0x33	・Read：0x32 ・Write：0x33
Class	0x31A、0x39D	0x31A:EXW1-RMV#、0x39D: EXW1-RMV#(Valve Output)
	0x3A0、0x39B	0x3A0:ON/OFF COUNT,0x39B:Logging Data
	0x39C、0x39D、0x39E 0x39F、0x3A1	0x39C：EX600-DX#,0x39D:EX600-DY#,0x39E:EX600-DM 0x39F：EX600-A##,0x3A1：EX600-L#B
Instance	0x01～1F	Wireless channel
Attribute	0x64～83	Parameter No. *1
Data[0]	0x01～09	Unit No +1 *1
Data[1]	0x00～0F	Channel No
Data[2]～[n]	***	Write Data (For write operations only)

*1: For the values to be specified, refer to the parameters of each unit.

[Response]

Data	Value	Note
Ack[0]～[3]	0xB2000000 / 0xB3000000	Successfully reading 0xB2000000、 Successfully writing：0xB3000000 Refer to the CIP error codes.
Data[0]～[n]	***	Read data (For read operations only)

Each item is abbreviated as follows.
Class:Cla, Instance:Ins, Attribute:Att, Data[0]:D[0], Data[1]:D[1], Read only：Get,
Read or Write：Get/Set

The following are CIP error code.

-Reading

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service is not supported	0x08	
Path destination unknown	0x05	
Object instance does not exist	0x16	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

-Writing

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service not supported	0x08	
Path destination unknown	0x05	
Attribute not settable	0x0E	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

EXW1-RMV#M5C

● Remote Parameters **Class: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	Get/ Set	0x01 - 0x1F (Wireless Ch)	0x66	0x00	0x00	byte	0: Disable 1: Enable
Brown-out Detection for US1	US2 (for outputs) Power Supply Voltage Drop			0x67			byte	0: Disable 1: Enable
Output State Fieldbus FaultIdle	Specifies the output state when communication with the host is lost or during Idle mode			0x68			byte	0x00：Clear 0x01：Hold 0x02：Individual
Output State for RF Timeout	Output settings when wireless communication is lost (timeout)			0x69			byte	0x00：Clear 0x01：Hold 0x02：Individual
AD Update Time	Analog Update Time			0x6A			2 bytes	100-60000(500)
Byte Order of Analog Values	Endian Type (Analog Only)			0x6B			byte	0x00：LSB-MSB (Little Endian) 0x01：MSB-LSB (Big Endian)
Valve Output	Number of occupied points on the valve manifold			0x6C			byte	0x00：0 points 0x01：8 points 0x02：16 points 0x03：24 points 0x04：32 points
ON/OFF Count Mode	Setting the Measurement Target for ON/OFF Time Measurement			0x6E			byte	0x11: Input8ch/Output8ch 0x20: Input16ch

● Diagnostic Parameters Remote **Class: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Unit Address Order	IO Module Assignment Direction	Get	0x01 - 0x1F (Wireless Ch)	0x6D	0x00	0x00	byte	0x00：Mode1 0x01：Mode 2
Configuration Memory Mode	Configuration Storage Function			0x6F			byte	0: Disable 1: Enable
Configured Unit List	Reading the configuration data stored during pairing			0x70			10 bytes	For details, refer to page 156
Connected Unit List	Reading the Current Configuration Data			0x71			10 bytes	For details, refer to page 156

● Diagnostic Parameters Valve Output **Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67		0x00-0x0F	byte	0x01 - 0xFF (Reset with any non-zero value.) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	Generates error when the operation count exceeds the set value	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Exceeded ON/OFF Counter Limit						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Exceeded ON/OFF Counter Limit						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
Ch 7-0: Open Circuit Detection	Detects an open circuit			0x69		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detection						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Open Circuit Detection						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Open Circuit Detection						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

● Diagnostic Parameters Valve Output (continued) **Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	Get	0x01 - 0x1F (Wireless Ch)	0x6A	0x01 - 0x08	0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 23-16: Short Circuit Detection (Output)						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch23	…	Ch16
Ch 31-24: Short Circuit Detection (Output)						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch31	…	Ch24

● Unit Parameters ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Ch #: Timer Trigger	Measurement Start/End Channel and Trigger Settings	Get/Set	0x01 - 0x1F (Wireless Ch)	0x64	0x01 - 0x08	0x00 - 0x0F	2 bytes	0x01-0x2F2E (refer to page225) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Upper Limit Detection Value *1,*2	Upper Threshold Setting			0x65			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Lower Limit Detection Value *1,*2	Upper Threshold Setting			0x66			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Notification set point *1	Sets the number of outside-of threshold range measurements to send notification			0x67			2 bytes	0x00 - 0xFFFF : 0 - 65535 回 (0x05) D[1]: Timer Ch 0-15 For details, refer to page 231

*1: A value of 0 disables the setting. For details, refer to "Log Function and Notification Function" (page 223).
*2: Configure the threshold values so that the upper threshold is greater than the lower threshold.

● Diagnostic Parameters　ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Latest value *1	Latest Measurement Time	Get	0x01 - 0x1F (Wireless Ch)	0x68	0x01 - 0x08	0x00	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Average value *1	Average of the Last 8 Measurements			0x69			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Maximum value *1	Maximum Value Since Measurement Start			0x6A			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Minimum value *1	Minimum Value Since Measurement Start			0x6B			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Out of range *2	Number of Out-of-Threshold Measurements			0x6C			32 bytes	0x00 - 0xFFFF： 0 - 65535 回 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
All count value *3	Total Number of Measurements			0x6D			64 bytes	0x00 - 0xFFFFFFFF： 0 - 4294967295 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Ch #: Clear	Reset the latest, average, maximum and minimum values to 0	Set		0x6E		0x00 - 0x0F	byte	0x01 (Clear) D[1]: Timer Ch 0-15
	Reset the latest, average, maximum and minimum values to 0						byte	0x0FF (All clear) D[1]: Timer Ch 0-15
Ch 7-0: Exceeded specified Limit *4	Detects the upper limit of ON/OFFs	Get		0x6F		0x00	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch7 … Timer Ch0
Ch 15-8: Exceeded specified Limit *4						0x08	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch15 … Timer Ch8

*1: The value is 0 if the ON/OFF Time Measurement Function has not been performed. For details, refer to "Acquired Data" (page 228).
*2: This value is obtained when the threshold setting is enabled (non-zero) and the measured value is outside the threshold range.
For details, refer to "Log Function and Notification Function" (page 223).
*3: For details, refer to "Acquired Data" (page 228).
*4: When the Notification Function is enabled, a diagnostic event is detected when the specified count is exceeded.

● Diagnostic Parameters　Logger　**Class: 0x039B**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Log 1 *1	Show 5 log entries	Get	0x01 - 0x1F (Wireless Ch)	0x68	0x01 - 0x7F	0x00	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11 ：All measured times All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log Refer to page 232
:	:			:			:	:
Log 8 *1	Show 5 log entries			0x6F			120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No - 35** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No – 36** : Byte48-49：**Log No – 37** : Byte72-73：**Log No – 38** : Byte96-97：**Log No – 39** : Byte112-119：Time stamp Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1：From each log (Log1–Log8), you can obtain 5 entries. Log1 represents the newest log, and Log8 the oldest.

Diagnostic Parameters　Logger(continued)　**Class: 0x039B**

名称	定義	Type	Ins	Att	D[0]	D[1]	Size	Value
Log *1	Timer Channel Logs	Get	0x01 - 0x1F (Wireless Ch)	0x74	0x01 - 0x0F	0x00 - 0x0F	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF
								Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp
								Read 5 logs at once. “Log No”: Latest log D [1]: Timer Ch No 0 – 15 Refer to page 232
Log Clear	Clear Logs for Each Timer Channel	Set		0x83		0x00	byte	0x01 – 0xFF (Any value can be used for the data)

*1: Logs for each Timer Channel No. can be retrieved. Up to five logs can be stored for each Timer Channel No.

Digital Input Module (EX600-DX#)

● Diagnostic Parameters　Digital Input **Class: 0x039C**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
ON/OFF Counter Value	ON/OFF Number of Operations	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x01 - 0x08	0x00 - 0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295		
								D[1]: Ch0-Ch15		
ON/OFF Counter Value Reset	ON/OFF Clear Operation Count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable)		
								D[1]: Ch0-Ch15		
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 7-0: Open Circuit Detected	ON/OFF Operation Count Limit Detection			0x69		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Open Circuit Detected						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 7-0: Short Circuit Detection (Input)	ON/OFF Operation Count Limit Detection			0x6A		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Short Circuit Detection (Input)						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8

Digital Output Module (EX600-DY#)

● Diagnostic Parameters　Digital Output　**Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295
								D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x01 - 0xFF (Any value is acceptable)
								D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected.			0x69		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detection						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Short Circuit Detection (Output)	The short circuit of the power supply for the input device has been detected	Get		0x6A		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Digital Input/Output Module (EX600-DM#)

● Diagnostic Parameters　Digital Input/Output **Class: 0x039E**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x07	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch7
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch7
Ch 7-0: Exceeded ON/OFF Counter Limit *Input Unit	ON/OFF count value of input has exceeded the set value	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Exceeded ON/OFF Counter Limit *Output Unit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Open Circuit Detection *Output Unit	The open circuit of the output device has been detected			0x69		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (OUTPUT)	Detects short circuits in output devices			0x6A		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (INPUT)	Detects short circuits in Input devices			0x6B		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

Analog Input,Output,and I/O Modules (EX600-A#B)

● Diagnostic Parameters　Analog Unit **Class: 0x039F**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
User Setting Value Lower Limit Error	Lower Limit Error	Get	0x01 - 0x1F (Wireless Ch)	0x64	0x01 - 0x08	0x00-0x03	byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
User Setting Value Upper Limit Error	Upper Limit Error			0x65			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Under Range Detection	Lower Range Limit Error Occurrence			0x66			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Over Range Detection	Range Upper Limit Error Occurrence			0x67			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Short Circuit Detection	Short-Circuit Diagnosis for Input/Output Device Power Supplies			0x68			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0

IO-Link Master Unit (EX600-L#B1)

● Unit Parameters　IO-Link Master Unit **Class: 0x03A1**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Input data size for IOL	Set the Process Data Size Setting	Get/ Set	0x01- 0x1F (Wireless Ch)	0x64	0x02 - 0x05	0x00	byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte
Output data size for IOL	Set the Process Data Size Setting			0x65			byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte

● Diagnostic Parameters　IO-Link Master **Class: 0x03A1**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
IO-Link PortStatusInfo	Port Status Info	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x02 - 0x05	0x00	byte	0x00:NO_DEVICE 0x01:DEACTIVATED 0x02:PORT_DIAG 0x03:PREOPERATE 0x04:OPERATE 0x05:DI_C/Q 0x06:DO_C/Q
IO-Link PortQualityInfo	Port Quality Info			0x67			byte	Bit2-7: Reserve; Bit1: Output; bit0: Input 0x00 : valid/PDOUTvalid 0x01 : invalid/PDOUTvalid 0x02 : valid/PDOUTinvalid 0x03 : invalid/PDOUTinvalid
IO-Link Revision ID	Device IO-Link version			0x68			byte	0x00-0xFF:0-255
IO-Link Transmission rate	Communication Speed			0x69			byte	0x00 : NDT_DETECTED 0x01 : COM1 0x02 : COM2 0x03 : COM3
IO-Link Master Cycle Time	Actual cycle time value			0x6A			byte	0x00-0xFF:0-255
IO-Link Input Data Length	Process Input Data Length			0x6B			byte	0x00-0xFF:0-32
IO-Link Output Data Length	Process Output Data Length			0x6C			byte	0x00-0xFF:0-32
IO-Link Vendor ID	Vendor ID of the Connected IO-Link Device			0x6D			2 bytes	0x00-0xFFFF:0-65535
IO-Link Device ID	Device ID of the Connected IO-Link Device			0x6E			3 bytes	0x00-0xFFFFFF : 0–1677215

Modbus TCP / SLMP

When using Wireless Protocol V.2.0, use asynchronous communication to check diagnostic data, read and write various parameters.

When using Wireless Protocol V.1.0, use asynchronous communication is not supported. For checking diagnostic data and reading and writing various parameters, please use the IO Configurator.

For more details, please refer to the EXW1-BMTAC instruction manual.
The manual of EXW1-BMTAC, No.DOC1145637(Page 10)

Supported Command / Data Items

Asynchronous communication can be used to check diagnostic data, and read and write various parameters. The support command format is shown below.

[Support command]

Command	Specified Address Range	Modbus TCP	SLMP
Request	0x1300 – 0x136F	Write Multiple Registers (0x10)	Write all (0x1401)
Response	0x1400 – 0x146F	Read Holding Registers (0x03)	Read all (0x0401))

[Data Items]

Item Value	Item Value	Note
Sequence Number	0x01-0xFFFF	This is a number that manages the correlation between requests and responses. Assign a value incremented for each request.
Command Message Type	0x0010	Asynchronous command, fixed
Service Code	0x32、0x33、 0xB2、0xB3	Service code Read Request:0x32 Write Request: 0x33, Read Request: 0xB2 ,Write Request: 0xB3
Status Code	0x00、0x03、0x05、 0x08、0x0B、0x20	Refer to Status Code
Parameter Unit ID	0x31A、0x39D	0x31A: EXW1-RMV#、0x39D: EXW1-RMV#(Valve Output)
	0x3A0、0x39B	0x3A0:ON/OFF COUNT、0x39B:Logging Data
	0x39C、0x39D、 0x39E、0x39F、 0x3A1	0x39C：EX600-DX#,0x39D:EX600-DY#, 0x39E：EX600-DM,0x39F：EX600-A##, 0x3A1：EX600-L#B
WCh	0x01～7F	Wireless channel
Parameter No.	0x64～83	Parameter No. *1
Unit Number	0x01～09	Unit No +1 *1
Channel Number	0x00～0F	Channel No
Data Size	0x01～FF	Effective size information of attached data [byte]: 1-255［byte］
Data[0]～[n]	***	Target Data
Padding Data	0x00	Data that must be included to ensure a fixed data length.

*1: For the values to be specified, refer to the parameters of each unit.

The individual items are abbreviated as follows.

Item Value	Abbreviation
WCh Number	WCh
Parameter No.	Para
Unit Number	Unit
Channel Number	Chal

Read request / Response command format

[Read request command format]

Data	Value	Note
Service code	0x32	Service code, Read request
Parameter Unit ID	0x31A、0x39D、0x3A0、0x39B、0x39C、0x39D、0x39E、0x39F、0x3A1	0x31A:EXW1-RMV#, 0x39D: EXW1-RMV#(Valve Output) 0x3A0:ON/OFF COUNT, 0x39B:Logging Data 0x39C：EX600-DX#, 0x39D:EX600-DY# 0x39E:EX600-DM, 0x39F：EX600-A## 0x3A1：EX600-L#B
WCh	0x01～3F	Wireless channel
Parameter No.	0x64～83	Parameter No. *1
Unit Number	0x01～09	Unit No＋1*1
Channel Number	0x00～0F	Target Channel Channel
Padding Data	0x0000	To ensure a fixed transmission data size, please pad with “0000h” before sending.

*1: For the values to be specified, refer to the parameters of each unit.

[Read response command format]

Data	Value	Note
Service code	0xB2	Service code, Read response
Parameter Unit ID	0x31A、0x39D、0x3A0、0x39B、0x39C、0x39D、0x39E、0x39F、0x3A1	0x31A:EXW1-RMV#, 0x39D: EXW1-RMV#(Valve Output) 0x3A0:ON/OFF COUNT, 0x39B:Logging Data 0x39C：EX600-DX#, 0x39D:EX600-DY# 0x39E:EX600-DM, 0x39F：EX600-A## 0x3A1：EX600-L#B
WCh	0x01～3F	Wireless channel
Parameter No.	0x64～83	Parameter No. *1
Unit Number	0x01～09	Unit No＋1*1
Channel Number	0x00～0F	Target Channel Channel
Read Data Size	0x01～FF	Data Size［byte］ 2*n or 2*n-1
Read Data Value Data[0]～[n]	***	Read data
Padding Data	0x0000	To ensure a fixed transmission data size, please pad with “0000h” before sending.

*1: For the values to be specified, refer to the parameters of each unit.

Write request / Response command format

[Write request command format]

Data	Value	Note
Service code	0x33	Service code, Write request
Parameter Unit ID	0x31A、0x39D、0x3A0、0x39B、0x39C、0x39D、0x39E、0x39F、0x3A1	0x31A:EXW1-RMV#，0x39D: EXW1-RMV#(Valve Output) 0x3A0:ON/OFF COUNT，0x39B:Logging Data 0x39C：EX600-DX#，0x39D:EX600-DY# 0x39E:EX600-DM，0x39F：EX600-A## 0x3A1：EX600-L#B
WCh	0x01～3F	Wireless channel
Parameter No.	0x64～83	Parameter No. *1
Unit Number	0x01～09	Unit No +1 *1
Channel Number	0x00～0F	Target Channel Channel
Write Data Size	0x01～FF	Data Size［byte］ 2*n or 2*n-1
Write Data Value Data[0]～[n]	***	Write data
Padding Data	0x0000	To ensure a fixed transmission data size, please pad with “0000h” before sending.

*1: For the values to be specified, refer to the parameters of each unit.

[Write response command format]

Data	Value	Note
Service code	0xB3	Service code, Write response
Parameter Unit ID	0x31A、0x39D、0x3A0、0x39B、0x39C、0x39D、0x39E、0x39F、0x3A1	0x31A:EXW1-RMV#，0x39D: EXW1-RMV#(Valve Output) 0x3A0:ON/OFF COUNT，0x39B:Logging Data 0x39C：EX600-DX#，0x39D:EX600-DY# 0x39E:EX600-DM，0x39F：EX600-A## 0x3A1：EX600-L#B
WCh	0x01～3F	Wireless channel
Parameter No.	0x64～83	Parameter No. *1
Unit Number	0x01～09	Unit No +1 *1
Channel Number	0x00～0F	Target Channel Channel
Padding Data	0x0000	To ensure a fixed transmission data size, please pad with “0000h” before sending.

*1: For the values to be specified, refer to the parameters of each unit.

Status Code

Value	Detail	Countermeasures	Note
0x00	Success	－	SUCCESS
0x03	**Command Message Type** is incorrect / When writing did not occur with the acyclic command data format size (224 bytes)	**Command Message Type** Please verify the request value. Please check your data transmission settings.	INVALID_PARAMETER_VALUE
0x05	When an unpaired **WCh Number** is selected	**WCh Number** Please verify the requested value.	PATH_DESTINATION_UNKNOWN
0x08	When a service code other than a read request (32h) or write request (33h) is received	Please verify the service code you submitted as a request.	SERVICE_NOT_SUPPORTED
0x0B	The command could not be processed because other tasks are currently running.	**SQNo.** Increment and resend.	Busy
0x20	＜The following phenomena occur during SMI communication＞ ・When there is an error in the value within the command data ・When wireless communication is not connected or times out	After verifying the request data, please increment the **SQNo.** and resend it.	INVALID_PARAMETER

EXW1-RMV#M5C

● Remote Parameters **Parameter Unit ID: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Brown-out Detection for US1	US1(Control and Input) Power Supply Voltage Drop	Get/ Set	0x01 - 0x1F (Wireless Ch)	0x66	0x00	0x00	byte	0: Disable 1: Enable
Brown-out Detection for US1	US2 (for outputs) Power Supply Voltage Drop			0x67			byte	0: Disable 1: Enable
Output State Fieldbus FaultIdle	Specifies the output state when communication with the host is lost or during Idle mode			0x68			byte	0x00：Clear 0x01：Hold 0x02：Individual
Output State for RF Timeout	Output settings when wireless communication is lost (timeout)			0x69			byte	0x00：Clear 0x01：Hold 0x02：Individual
AD Update Time	Analog Update Time			0x6A			2 bytes	100-60000(500)
Byte Order of Analog Values	Endian Type (Analog Only)			0x6B			byte	0x00：LSB-MSB (Little Endian) 0x01：MSB-LSB (Big Endian)
Valve Output	Number of occupied points on the valve manifold			0x6C			byte	0x00：0 points 0x01：8 points 0x02：16 points 0x03：24 points 0x04：32 points
ON/OFF Count Mode	Setting the Measurement Target for ON/OFF Time Measurement			0x6E			byte	0x11: Input8ch/Output8ch 0x20: Input16ch

● Diagnostic Parameters Remote **Parameter Unit ID: 0x031A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Unit Address Order	IO Module Assignment Direction	Get	0x01 - 0x1F (Wireless Ch)	0x6D	0x00	0x00	byte	0x00：Mode1 0x01：Mode 2
Configuration Memory Mode	Configuration Storage Function			0x6F			byte	0: Disable 1: Enable
Configured Unit List	Reading the configuration data stored during pairing			0x70			10 bytes	For details, refer to page 156
Connected Unit List	Reading the Current Configuration Data			0x71			10 bytes	For details, refer to page 156

● Diagnostic Parameters Valve Outpu **Parameter Unit ID: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x1F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67		0x00-0x0F	byte	0x01 - 0xFF (Reset with any non-zero value.) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	Generates error when the operation count exceeds the set value	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Exceeded ON/OFF Counter Limit						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Exceeded ON/OFF Counter Limit						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24
Ch 7-0: Open Circuit Detection	Detects an open circuit			0x69		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detection						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 23-16: Open Circuit Detection						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch23 … Ch16
Ch 31-24: Open Circuit Detection						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled Bit7 … Bit0 Ch31 … Ch24

● Diagnostic Parameters Valve Output (continued) **Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
Ch 7-0: Short Circuit Detection (Output)	Detects short circuits in output devices	Get	0x01 - 0x1F (Wireless Ch)	0x6A	0x01 - 0x08	0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 23-16: Short Circuit Detection (Output)						0x10-0x17	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch23	…	Ch16
Ch 31-24: Short Circuit Detection (Output)						0x18-0x1F	byte	0x00 - 0xFF 0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch31	…	Ch24

● Unit Parameters ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Ch #: Timer Trigger	Measurement Start/End Channel and Trigger Settings	Get/Set	0x01 - 0x1F (Wireless Ch)	0x64	0x01 - 0x08	0x00 - 0x0F	2 bytes	0x01-0x2F2E (refer to page225) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Upper Limit Detection Value *1,*2	Upper Threshold Setting			0x65			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Lower Limit Detection Value *1,*2	Upper Threshold Setting			0x66			2 bytes	0x00 – 0xFFFF : 0 - 65535 ms (0x00) D[1]: Timer Ch 0-15 For details, refer to page 231
Ch #: Notification set point *1	Sets the number of outside-of threshold range measurements to send notification			0x67			2 bytes	0x00 - 0xFFFF : 0 - 65535 回 (0x05) D[1]: Timer Ch 0-15 For details, refer to page 231

*1: A value of 0 disables the setting. For details, refer to "Log Function and Notification Function" (page 223).
*2: Configure the threshold values so that the upper threshold is greater than the lower threshold.

● Diagnostic Parameters　ON/OFF Count **Class: 0x039A**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Latest value *1	Latest Measurement Time	Get	0x01 - 0x1F (Wireless Ch)	0x68	0x01 - 0x08	0x00	32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Average value *1	Average of the Last 8 Measurements			0x69			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Maximum value *1	Maximum Value Since Measurement Start			0x6A			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Minimum value *1	Minimum Value Since Measurement Start			0x6B			32 bytes	0x00 - 0xFFFF： 0 - 65535 ms Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Out of range *2	Number of Out-of-Threshold Measurements			0x6C			32 bytes	0x00 - 0xFFFF： 0 - 65535 回 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
All count value *3	Total Number of Measurements			0x6D			64 bytes	0x00 - 0xFFFFFFFF： 0 - 4294967295 Retrieves data for all 16 Timer Channels at once. For details, refer to page 231
Ch #: Clear	Reset the latest, average, maximum and minimum values to 0	Set		0x6E		0x00 - 0x0F	byte	0x01 (Clear) D[1]: Timer Ch 0-15
	Reset the latest, average, maximum and minimum values to 0						byte	0x0FF (All clear) D[1]: Timer Ch 0-15
Ch 7-0: Exceeded specified Limit *4	Detects the upper limit of ON/OFFs	Get		0x6F		0x00	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch7 … Timer Ch0
Ch 15-8: Exceeded specified Limit *4						0x08	byte	0x00 – 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Timer Ch15 … Timer Ch8

*1: The value is 0 if the ON/OFF Time Measurement Function has not been performed. For details, refer to "Acquired Data" (page 228).
*2: This value is obtained when the threshold setting is enabled (non-zero) and the measured value is outside the threshold range.
For details, refer to "Log Function and Notification Function" (page 223).
*3: For details, refer to "Acquired Data" (page 228).
*4: When the Notification Function is enabled, a diagnostic event is detected when the specified count is exceeded.

● Diagnostic Parameters　Logger　**Class: 0x039B**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
Log 1 *1	Show 5 log entries	Get	0x01 - 0x1F (Wireless Ch)	0x68	0x01 - 0x7F	0x00	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11 ：All measured times All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp Read 5 logs at once. “Log No”: Latest log Refer to page 232
:	:			:			:	:
Log 8 *1	Show 5 log entries			0x6F			120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF Byte0-1：**Log No - 35** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No – 36** : Byte48-49：**Log No – 37** : Byte72-73：**Log No – 38** : Byte96-97：**Log No – 39** : Byte112-119：Time stamp Read 5 logs at once. “Log No-39”: Oldest log. When the log information is updated, the update starts from 'Log No-39'. Refer to page 232

*1：From each log (Log1–Log8), you can obtain 5 entries. Log1 represents the newest log, and Log8 the oldest.

Diagnostic Parameters　Logger(continued)　**Class: 0x039B**

名称	定義	Type	Ins	Att	D[0]	D[1]	Size	Value
Log *1	Timer Channel Logs	Get	0x01 - 0x1F (Wireless Ch)	0x74	0x01 - 0x0F	0x00 - 0x0F	120 bytes (24 bytes x Log No 5 Log)	0x00...00 - 0xFF...FF
								Byte0-1：**Log No** Byte2：Timer Ch Byte3：Reserved Byte4-Byte5：Measured value Byte6-7：Out of range times Byte8-11：All measured times Byte16-23：Time stamp Byte24-25：**Log No - 1** : Byte48-49：**Log No - 2** : Byte72-73：**Log No - 3** : Byte96-97：**Log No - 4** : Byte112-119：Time stamp
								Read 5 logs at once. “Log No”: Latest log D [1]: Timer Ch No 0 – 15 Refer to page 232
Log Clear	Clear Logs for Each Timer Channel	Set		0x83		0x00	byte	0x01 – 0xFF (Any value can be used for the data)

*1: Logs for each Timer Channel No. can be retrieved. Up to five logs can be stored for each Timer Channel No.

Digital Input Module (EX600-DX#)

● Diagnostic Parameters　Digital Input **Parameter Unit ID: 0x039C**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Number of Operations	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00 - 0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch15
ON/OFF Counter Value Reset	ON/OFF Clear Operation Count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch15
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF Operation Count Limit Detection	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Open Circuit Detected	ON/OFF Operation Count Limit Detection			0x69		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Open Circuit Detected						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8
Ch 7-0: Short Circuit Detection (Input)	ON/OFF Operation Count Limit Detection			0x6A		0x00 - 0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 15-8: Short Circuit Detection (Input)						0x08 - 0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch15 … Ch8

Digital Output Module (EX600-DY#)

● Diagnostic Parameters　Digital Output　**Class: 0x039D**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x0F	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295		
								D[1]: Ch0-Ch15		
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x01 - 0xFF (Any value is acceptable)		
								D[1]: Ch0-Ch15		
Ch 7-0: Exceeded ON/OFF Counter Limit	ON/OFF count value of input has exceeded the set value.	Get		0x68		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Exceeded ON/OFF Counter Limit						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 7-0: Open Circuit Detection	The open circuit of the output device has been detected.			0x69		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Open Circuit Detection						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8
Ch 7-0: Short Circuit Detection (Output)	The short circuit of the power supply for the input device has been detected.	Get		0x6A		0x00 - 0x07	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Ch 15-8: Short Circuit Detection (Output)						0x08 - 0x0F	byte	0x00 - 0xFF		
								0: No diagnostics, 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch15	…	Ch8

Digital Input/Output Module (EX600-DM#)

● Diagnostic Parameters　Digital Input/Output **Class: 0x039E**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
ON/OFF Counter Value	ON/OFF Operation Count	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x01 - 0x08	0x00-0x07	4 bytes	0x00 - 0xFFFFFFFF : 0 - 4294967295 D[1]: Ch0-Ch7
ON/OFF Counter Value Reset	ON/OFF Clear operation count	Set		0x67			byte	0x00 - 0xFF (Any value is acceptable) D[1]: Ch0-Ch7
Ch 7-0: Exceeded ON/OFF Counter Limit *Input Unit	ON/OFF count value of input has exceeded the set value	Get		0x68		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Exceeded ON/OFF Counter Limit *Output Unit						0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Open Circuit Detection *Output Unit	The open circuit of the output device has been detected			0x69		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (OUTPUT)	Detects short circuits in output devices			0x6A		0x08-0x0F	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0
Ch 7-0: Short Circuit Detection (INPUT)	Detects short circuits in Input devices			0x6B		0x00-0x07	byte	0x00 - 0xFF 0: No diagnostics, 1: Diagnostics enabled Bit7 … Bit0 Ch7 … Ch0

Analog Input,Output,and I/O Modules (EX600-A#B)

● Diagnostic Parameters　Analog Unit **Class: 0x039F**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value		
User Setting Value Lower Limit Error	Lower Limit Error	Get	0x01 - 0x7F (Wireless Ch)	0x64	0x01 - 0x08	0x00-0x03	byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
User Setting Value Upper Limit Error	Upper Limit Error			0x65			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Under Range Detection	Lower Range Limit Error Occurrence			0x66			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Over Range Detection	Range Upper Limit Error Occurrence			0x67			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0
Short Circuit Detection	Short-Circuit Diagnosis for Input/Output Device Power Supplies			0x68			byte	0x00 - 0xFF		
								0: No diagnostics 1: Diagnostics enabled		
								Bit7	…	Bit0
								Ch7	…	Ch0

IO-Link Master Unit (EX600-L#B1)

● Unit Parameters　IO-Link Master Unit **Class: 0x03A1**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value (Default)
Input data size for IOL	Set the Process Data Size Setting	Get/ Set	0x01- 0x7F (Wireless Ch)	0x64	0x02 - 0x05	0x00	byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte
Output data size for IOL	Set the Process Data Size Setting			0x65			byte	0x00 : 0byte 0x01 : 2byte 0x02 : 4byte 0x08 : 8 byte 0x10 : 16byte 0x20 : 32byte

● Diagnostic Parameters　IO-Link Master **Class: 0x03A1**

Name	Definition	Type	Ins	Att	D[0]	D[1]	Size	Value
IO-Link PortStatusInfo	Port Status Info	Get	0x01 - 0x7F (Wireless Ch)	0x66	0x02 - 0x05	0x00	byte	0x00:NO_DEVICE 0x01:DEACTIVATED 0x02:PORT_DIAG 0x03:PREOPERATE 0x04:OPERATE 0x05:DI_C/Q 0x06:DO_C/Q
IO-Link PortQualityInfo	Port Quality Info			0x67			byte	Bit2-7 Reserve / Bit1 Output / bit0 Input 0x00 : valid/PDOUTvalid 0x01 : invalid/PDOUTvalid 0x02 : valid/PDOUTinvalid 0x03 : invalid/PDOUTinvalid
IO-Link Revision ID	Device IO-Link version			0x68			byte	0x00-0xFF:0-255
IO-Link Transmission rate	Communication Speed			0x69			byte	0x00 : NOT_DETECTED 0x01 : COM1 0x02 : COM2 0x03 : COM3
IO-Link Master Cycle Time	Actual cycle time value			0x6A			byte	0x00-0xFF:0-255
IO-Link Input Data Length	Process Input Data Length			0x6B			byte	0x00-0xFF:0-32
IO-Link Output Data Length	Process Output Data Length			0x6C			byte	0x00-0xFF:0-32
IO-Link Vendor ID	Vendor ID of the Connected IO-Link Device			0x6D			2 bytes	0x00-0xFFFF:0-65535
IO-Link Device ID	Device ID of the Connected IO-Link Device			0x6E			3 bytes	0x00-0xFFFFFF : 0–1677215

Configuration Memory Data Read

The following is an example of the configuration data acquired by reading the remote configuration shown below.
The configuration data values differ according to the I/O module assignment direction setting.

Remote Configuration

End Plate	DX#D Digital Input	DYPF Digital Output	DX#D Digital Input	AMB Analog Input/Output	EXW1-RMV# remote	Valve Manifold 32 points

・I/O Assignment: Mode 1

Configured Unit List：Reading the configuration data stored during pairing

1byte	2byte	3byte	4byte	5byte	6byte	7byte	8byte	9byte	10byte
Unit0	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7	Unit8	Unit9
DX#D	DYPF	DX#D	AMB	EXW1-RMV#	None	None	None	None	None
Read Data									
05h	17h	05h	23h	70h	00	00	00	00	00

Connected Unit List：Reading the Current Configuration Data

1byte	2byte	3byte	4byte	5byte	6byte	7byte	8byte	9byte	10byte
Unit0	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7	Unit8	Unit9
DX#D	DYPF	DX#D	AMB	EXW1-RMV#	ON/OFF Count	Logger	None	None	None
Read Data									
05h	17h	05h	23h	70h	5Fh	62h	00	00	00

*When the Connected Unit List is read, the ON/OFF Count function and Logger function may be mapped from the last unit, depending on the conditions. Refer to 197 page for details.

・I/O Assignment: Mode 2

Configured Unit List：Reading the configuration data stored during pairing

1byte	2byte	3byte	4byte	5byte	6byte	7byte	8byte	9byte	10byte
Unit0	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7	Unit8	Unit9
EXW1-RMV#	AMB	DX#D	DYPF	DX#D	None	None	None	None	None
Read Data									
70h	23h	05h	17h	05h	00	00	00	00	00

Connected Unit List：Reading the Current Configuration Data

1byte	2byte	3byte	4byte	5byte	6byte	7byte	8byte	9byte	10byte
Unit0	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6	Unit7	Unit8	Unit9
EXW1-RMV#	AMB	DX#D	DYPF	DX#D	ON/OFF Count	Logger	None	None	None
Read Data									
70h	23h	05h	17h	05h	5Fh	62h	00	00	00

I/O Module Identification Number (EX600)

Unit Name	Model	Unit Part Number	Identification Number
remote	RMV	EXW1-RMV#	70h
		ON/OFF Count	5Fh
		Logger	62h
Digital Input Module	DX	EX600-DX#B	01h
		EX600-DX#C	03h
		EX600-DX#D	05h
		EX600-DX#C1	0Dh
		EX600-DXNE	14h
		EX600-DXPE	15h
		EX600-DXNF	16h
		EX600-DXPF	17h
Digital Output Module	DY	EX600-DY#B	08h
		EX600-DYNE	18h
		EX600-DYPE	19h
		EX600-DYNF	1Ah
		EX600-DYPF	1Bh
Digital I/O Module	DM	EX600-DMNE	1Ch
		EX600-DMPE	1Dh
		EX600-DMNF	1Eh
		X600-DMPF	1Fh
Analog Input Module	AX	EX600-AXA	20h
		EX600-AXB	24h
Analog Output Module	AY	EX600-AYA	22h
Analog I/O Module	AM	EX600-AMB	23h
IO-Link Master Module	L#B	IO-Link SIO	71h
		IO-Link P1	72h
		IO-Link P2	73h
		IO-Link P3	74h
		IO-Link P4	75h
		IO-Link PQI	76h

IO-Link device parameter setting

The reading and writing parameters of IO-Link master and IO-Link devices can be performed using the following methods.

When using EXW1-BMJA, IO-Link device parameters can only be set by method 3 (the device buttons). IO-Link device parameters cannot be configured by methods 1 or 2.

1. IO-Link Device Tool V5.1 PE
   Refer to the manual(Page 10).

2. Fieldbus command
   Refer to each protocols.

3. Device button（Depends on IO-Link device）

EtherCAT　Modular device profile

To use the CoE Object Dictionary to check diagnostic data, read and write various parameters, and read and write IO-Link device parameters.

It is described as follows in the CoE table.

F801:0	IO-Link Access	RO	> 8 <
F801:01	Request	RW	Read (0)
F801:02	Wireless Channel	RW	0x00 (0)
F801:03	Port	RW	IO-Link Master (0)
F801:04	Index	RW	0x0000 (0)
F801:05	Subindex	RW	0x00 (0)
F801:06	Length	RW	0x0000 (0)
F801:07	Data	RW	00 00 00 00 00 00 00 00...
F801:08	Fault Code	RO	0x0000 (0)

Index	Name	定義	Size	Value
0xF801:0	IO-Link	-	-	8
0xF801:01	Request	Read or Write	BYTE	0x00: Read 0x01: Write
0xF801:02	Wireless Channel	Wireless channel	BYTE	0x01 - 0x3F: 1 - 63
0xF801:03	Port	IO-Link master port No (P1 - P4)	BYTE	0x00: IO-Link Master (Not used) 0x01: P1 0x02: P2 0x03: P3 0x04: P4
0xF801:04	Index	IO-Link device Index	USHORT	0x00 - 0xFFFF
0xF801:05	Subindex	IO-Link device Subindex	BYTE	0x00 - 0xFF
0xF801:06	Length	IO-Link device parameter size	BYTE	0x00 - 0xFF
0xF801:07	Data	Read or Write data	BYTE[]	0x00..00 - 0xFF..FF
0xF801:08	Fault code	IO-Link Master or IO-Link Device Fault code	USHORT	0xXXXX=IO-Link Response Code 0x8011=IO-Link Index Not Available 0x4011=IO-Link Subindex Not Available

If you change 0xF801:02 to 0xF801:07, the data will not be applied unless you perform a read or write operation on 0xF801:01.

EtherNet/IP™

To use EtherNet/IP™ Explicit Message to read IO-Link master parameters, and read and write IO-Link device parameters.
The data format is shown below.

- Write：0x32
- Read ：0x33

The following 5 types of data can be read or written in the SMI service.

No	Description	Data type	Read	Write
1	SMI_MasterIdentification	IO-Link master information	○	—
2	SMI_PortConfiguration	IO-Link master port parameter setting	○	—
3	SMI_PortStatus	Acquires IO-Link master port status	○	—
4	SMI_DeviceRead	Receives ISDU from IO-Link device	○	—
5	SMI_DeviceWrite	Sends ISDU to IO-Link device	—	○

The following are CIP error code.

- Reading

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service is not supported	0x08	
Path destination unknown	0x05	
Object instance does not exist	0x16	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

- Writing

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service not supported	0x08	
Path destination unknown	0x05	
Attribute not settable	0x0E	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

1. SMI_MasterIdentification (ExpArgBlockID 0x1001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x64	IO-Link Master
Data[0] - [2]	0x00	Fixed
Data[3]	0x01	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0] - [1]	Reserved	0x00
Data[2] - [3]	Vendor ID	IO-Link master vender ID(SMC：0x0083)
Data[4] - [7]	Master ID	IO-Link master ID (EX600-LAB1:0x0000003B,EX600-LBB1:10x0000003C)
Data[8]	Master type	IO-Link master type (0x02)
Data[9] - [10]	Feature	Functions that IO-Link master supports(0x0400)
Data[11]	Max number of ports	Maximum IO-Link port quantity of the IO-Link master (0x01, 0x02,0x03, 0x02)
Data[12]	Port 1 type	Port type 0x00：Class A(EX600-LAB1) 0x02：Class B(EX600-LBB1)
Data[13]	Port 2 type	
Data[14]	Port 3 type	
Data[15]	Port 4 type	

1-1. PDIn (ExpArgBlockID 0x1001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x01	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	PQI	
Data[1]	Input Data Length	
Data[2]	PDI0	
・・・	・・・	
Data[2+n]	PDIn	

1-2. PDOut (ExpArgBlockID 0x1002)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01～7F	Wireless channel
Attribute	0x65～68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x02	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Reserved	
Data[1]	Output Data Length	
Data[2]	PDO0	
・・・	・・・	
Data[2+n]	PDOn	

1-3. PDInOut (ExpArgBlockID 0x1003)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x03	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	PQI	
Data[1]	Reserved	
Data[2]	Input Data Length	
Data[3]	PDI0	
・・・	・・・	
Data[3+m]	PDIm	
Data[3+m+1]	Output Data Length	
Data[3+m+2]	PDO0	
・・・	・・・	
Data[3+m+2+n]	PDOn	

2. SMI_PortConfiguration (ExpArgBlockID 0x8000)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x80	Fixed
Data[3]	0x00	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Port mode	0x00：Deactivated 0x01：IOL_Manual 0x02：IOL_Autostart 0x03：DI_C/Q 0x04：DQ_C/Q
Data[1]	Validation&Backup	0x00：No Device Check 0x01：Type compatible Device V1.0 0x02：Type compatible Device V1.1 0x03：Type compatible Device V1.1、Backup+Restore 0x04：Type compatible Device V1.1、Restore
Data[2]	I/Q behavior (Pin2 at M12 Connector)	0x01：Digital input(EX600-LBA1) 0x05：Power2(EX600-LBB1)
Data[3]	Port Cycle time	Port Cycle time
Data[4]	Max number of ports	Maximum IO-Link port quantity of the IO-Link master
Data[5] - [6]	Vendor ID	Vendor ID for IO-Link device comparison function
Data[7] - [10]	Device ID	Vendor ID for IO-Link device comparison function

3. SMI_PortStatus (ExpArgBlockID 0x9000)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x90	Fixed
Data[3]	0x00	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Port Status Info	0x00：NO_DEVICE,0x01：DEACTIVATED, 0x02：PORT_DIAG,0x03：PREOPERATE, 0x04：OPERATE,0x05：DI_C/Q,0x06：DO_C/Q
Data[1].bit0	Port Quality Info input	0x00：Input process data valid 0x01：Input process data invalid
Data[1].bit1	Port Quality Info output	0x00：Output process data valid 0x01：Output process data invalid
Data[2]	RevisionID	IO-Link device revision ID
Data[3]	Transmission Rate	Communication speed 0x00：NOT_DETECTED,0x01：COM1,0x02：COM2 0x03：COM3
Data[4]	Master Cycle Time	Port cycle time
Data[5]	Input Data Length	Process input data length of connected IO-Link device
Data[6]	Output Data Length	Process Output data length of connected IO-Link device
Data[7] - [8]	Vendor ID	Vendor ID of connected IO-Link device
Data[9] - [12]	Device ID	Device ID of connected IO-Link device
Data[13]	Number of Diags	Event quantity*1
Data[14]	Event Qualifier 1	EventQualifier1*2
Data[15] - [16]	Event Code	Event code of IO-Link master or device*3
Data[17]	Event Qualifier 2	EventQualifier2*2
Data[18] - [19]	Event Code	Event code of IO-Link master or device*3
・・・	・・・	・・・

∗1: When the event quantity is "0", the data for Data[14] and later is not added. When the event quantity is "1", the total amount of Event Qualifier and event code 2 bytes (total bytes: 3) will be added. Data will be added by 3 bytes according to the event quantity.

∗2: The specifications of Event Qualifier# are described below.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Mode Type		Mode Type		Source	Instance		
0：Reserved 1：Event single shot 2：Event disappears 3：Event appears		0：Reserved 1：Notification 2：Warning 3：Error		0：Device 1：Master	0：Unknown 1-3：Reserved 4：Application 5-7：Reserved		

∗3: Refer to IO-Link master event code (Page **エラー! ブックマークが定義されていません。**).
Refer to Operation Manual of IO-Link Device for details of the event code of the IO-Link device.

4. SMI_DeviceRead (ExpArgBlockID 0x3001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x30	Fixed
Data[3]	0x00	Fixed
Data[4]	Index[0](MSB)	Refer to Operation Manual of IO-Link Device
Data[5]	Index[1](LSB)	
Data[6]	Subindex	Refer to Operation Manual of IO-Link Device

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading : 0xB2000000 Refer to the CIP error code
Data[0] - [#]	On request data	Refer to Operation Manual of IO-Link Device

5. SMI_DeviceWrite (ExpArgBlockID 0x3000)

[Request]

Data	Value	Note
Service code	0x33	
Class	0x90	
Instance	0x01 - 7F	Wireless channel
Attribute	0x65 - 68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x30	Fixed
Data[3]	0x00	Fixed
Data[4]	Index[0](MSB)	Refer to Operation Manual of IO-Link Device
Data[5]	Index[1](LSB)	
Data[6]	Subindex	Refer to Operation Manual of IO-Link Device
Data[7] - [#]	On request data	Refer to Operation Manual of IO-Link Device

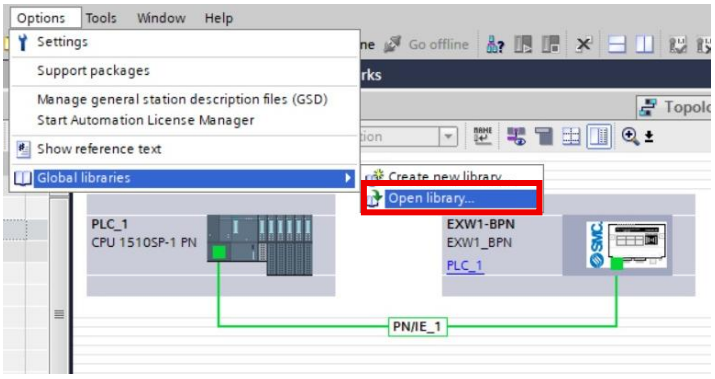
[Response]

Data	Value	Note
Ack[0] - [3]	0xB3000000	Successfully reading : 0xB2000000 Refer to the CIP error code

PROFINET

To use Asynchronous communication to read IO-Link master parameters, and read and write IO-Link device parameters.
This section provides examples of reading and writing IO-Link device parameters using IO_LINK_CALL in SIEMENS software TIA Portal V18.
For detailed operating procedures, please refer to the SIEMENS manual.

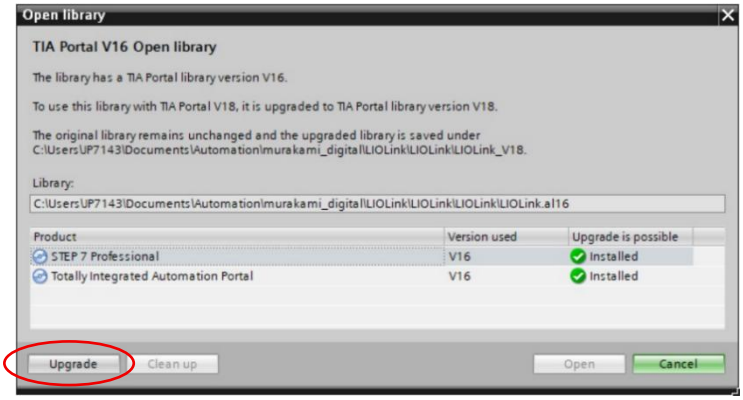
1. Download the IO-Link Library from the SIEMENS website
2. In the project screen, select ‘Retrieve Library...’ from Options.



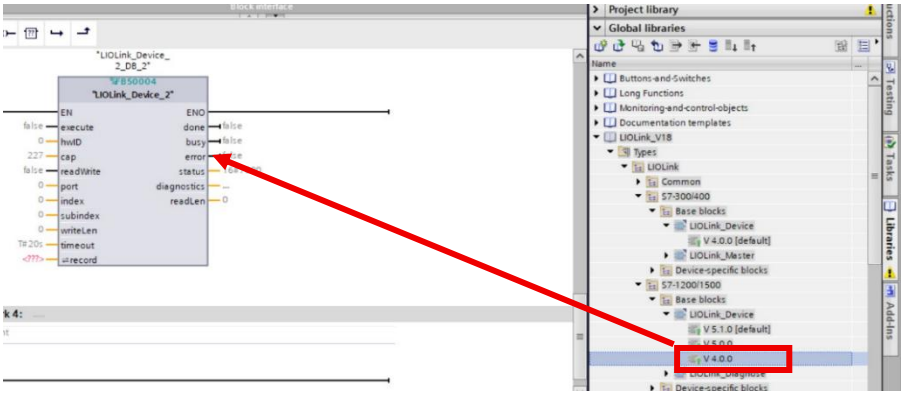
3. Select the file with the extension ‘.zal1’ from the downloaded files.



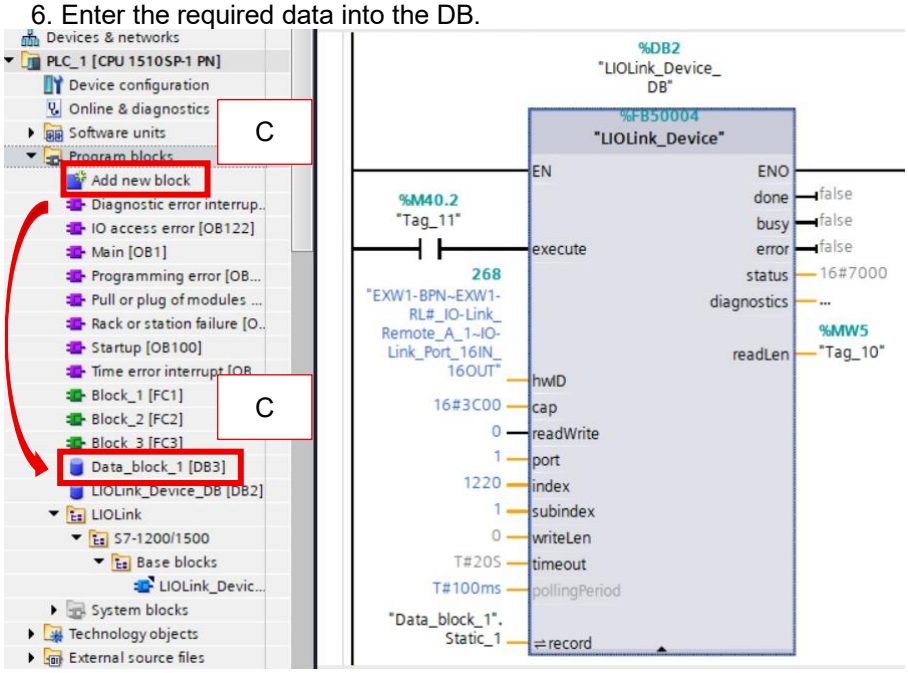
4. If the version is different, a conversion process will be required, so click the ‘Upgrade’ button.



5. From Global Libraries, expand the following path: Types → ‘S7-(the PLC you are using)’ → ‘Base blocks’ → ‘LIOLink_Device’. Then, drag and drop the row with the version information into your program.

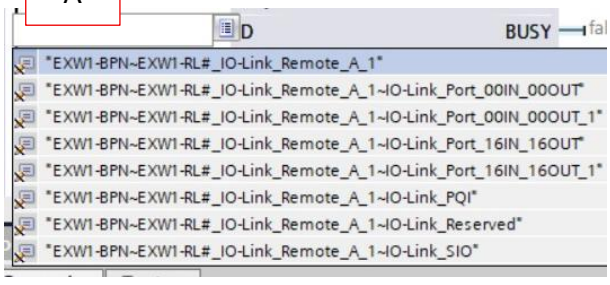


6. Enter the required data into the DB.

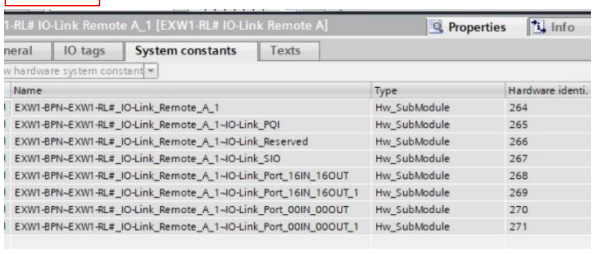


Name	Detail
execute	Execute the data read/write operation.
hwID	Select the module for the parameter to be read or written. Click on the ID and select the module directly (see section A in the figure), or enter the value of the Hardware Identifier from the Device view directly (see section B in the figure).
cap	0x3C00
readWrite	Read: 0、Write: 1
port	IO-Link port 1: 1、IO-Link port 2: 2、IO-Link port 3: 3、IO-Link port 4: 4
index	Index of the ISDU parameter for the IO-Link device to be read/written
subindex	Subindex of the ISDU parameter for the IO-Link device to be read/written
writeLen	Enter the byte size of the parameter to be written (0 for reading)
record	Create a DB using 'Add new block' and define the Data Type as Array[0..231] Byte (see section C in the figure).

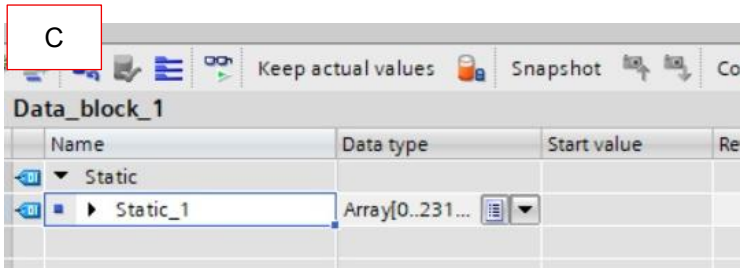
A



B



C



Example DB

Data_block_1

	Name	Data type	Start value	Monitor value	Retain
	Static				
	Static_1	Array[0..231] of Byte			
	Static_1[0]	Byte	16#07	16#0F	
	Static_1[1]	Byte	16#D0	16#A0	
	Static_1[2]	Byte	16#0	16#00	
	Static_1[3]	Byte	16#0	16#00	
	Static_1[4]	Byte	16#0	16#00	
	Static_1[5]	Byte	16#0	16#00	
	Static_1[6]	Byte	16#0	16#00	
	Static_1[7]	Byte	16#0	16#00	
	Static_1[8]	Byte	16#0	16#00	
	Static_1[9]	Byte	16#0	16#00	
	Static_1[10]	Byte	16#0	16#00	
	Static_1[11]	Byte	16#0	16#00	

Writing data

Current data

When the write operation is executed, the data will be applied.

DeviceNet®

To use DeviceNet® Explicit Message to read IO-Link master parameters, and read and write IO-Link device parameters.
The data format is shown below.

- Write：0x32
- Read ：0x33

The following 5 types of data can be read or written in the SMI service.

No	Description	Data type	Read	Write
1	SMI_MasterIdentification	IO-Link master information	○	—
2	SMI_PortConfiguration	IO-Link master port parameter setting	○	—
3	SMI_PortStatus	Acquires IO-Link master port status	○	—
4	SMI_DeviceRead	Receives ISDU from IO-Link device	○	—
5	SMI_DeviceWrite	Sends ISDU to IO-Link device	—	○

The following are CIP error code.

- Reading

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service is not supported	0x08	
Path destination unknown	0x05	
Object instance does not exist	0x16	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

- Writing

Details	Value	Note
Class, Instance, Attribute and Service Data are mismatch	0x05	Path destination unknown
Service not supported	0x08	
Path destination unknown	0x05	
Attribute not settable	0x0E	
Attribute not supported	0x14	
Not enough data	0x13	
Invalid parameter	0x20	
Already in requested mode state	0x0B	
Vendor Specific Error	0x1F	

1. SMI_MasterIdentification (ExpArgBlockID 0x1001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01～0x1F	Wireless channel
Attribute	0x64	IO-Link Master
Data[0] - [2]	0x00	Fixed
Data[3]	0x01	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0] - [1]	Reserved	0x00
Data[2] - [3]	Vendor ID	IO-Link master vender ID(SMC：0x0083)
Data[4] - [7]	Master ID	IO-Link master ID (EX600-LAB1:0x0000003B,EX600-LBB1:10x0000003C)
Data[8]	Master type	IO-Link master type (0x02)
Data[9] - [10]	Feature	Functions that IO-Link master supports(0x0400)
Data[11]	Max number of ports	Maximum IO-Link port quantity of the IO-Link master (0x01, 0x02,0x03, 0x02)
Data[12]	Port 1 type	Port type 0x00：Class A(EX600-LAB1) 0x02：Class B(EX600-LBB1)
Data[13]	Port 2 type	
Data[14]	Port 3 type	
Data[15]	Port 4 type	

1-1. PDIn (ExpArgBlockID 0x1001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x01	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	PQI	
Data[1]	Input Data Length	
Data[2]	PDI0	
・・・	・・・	
Data[2+n]	PDIn	

1-2. PDOut (ExpArgBlockID 0x1002)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01～7F	Wireless channel
Attribute	0x65～68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x02	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Reserved	
Data[1]	Output Data Length	
Data[2]	PDO0	
・・・	・・・	
Data[2+n]	PDOn	

1-3. PDInOut (ExpArgBlockID 0x1003)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x10	Fixed
Data[3]	0x03	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	PQI	
Data[1]	Reserved	
Data[2]	Input Data Length	
Data[3]	PDI0	
・・・	・・・	
Data[3+m]	PDIm	
Data[3+m+1]	Output Data Length	
Data[3+m+2]	PDO0	
・・・	・・・	
Data[3+m+2+n]	PDOn	

1. SMI_PortConfiguration (ExpArgBlockID 0x8000)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x80	Fixed
Data[3]	0x00	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Port mode	0x00：Deactivated 0x01：IOL_Manual 0x02：IOL_Autostart 0x03：DI_C/Q 0x04：DQ_C/Q
Data[1]	Validation&Backup	0x00：No Device Check 0x01：Type compatible Device V1.0 0x02：Type compatible Device V1.1 0x03：Type compatible Device V1.1、Backup+Restore 0x04：Type compatible Device V1.1、Restore
Data[2]	I/Q behavior (Pin2 at M12 Connector)	0x01：Digital input(EX600-LAB1) 0x05：Power2(EX600-LBB1)
Data[3]	Port Cycle time	Port Cycle time
Data[4]	Max number of ports	Maximum IO-Link port quantity of the IO-Link master
Data[5] - [6]	Vendor ID	Vendor ID for IO-Link device comparison function
Data[7] - [10]	Device ID	Vendor ID for IO-Link device comparison function

2. SMI_PortStatus (ExpArgBlockID 0x9000)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x90	Fixed
Data[3]	0x00	Fixed

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading：0xB2000000 Refer to the CIP error code
Data[0]	Port Status Info	0x00：NO_DEVICE,0x01：DEACTIVATED, 0x02：PORT_DIAG,0x03：PREOPERATE, 0x04：OPERATE,0x05：DI_C/Q,0x06：DO_C/Q
Data[1].bit0	Port Quality Info input	0x00：Input process data valid 0x01：Input process data invalid
Data[1].bit1	Port Quality Info output	0x00：Output process data valid 0x01：Output process data invalid
Data[2]	Revision ID	IO-Link device revision ID
Data[3]	Transmission Rate	Communication speed 0x00：NOT_DETECTED,0x01：COM1,0x02：COM2 0x03：COM3
Data[4]	Master Cycle Time	Port cycle time
Data[5]	Input Data Length	Process input data length of connected IO-Link device
Data[6]	Output Data Length	Process Output data length of connected IO-Link device
Data[7] - [8]	Vendor ID	Vendor ID of connected IO-Link device
Data[9] - [12]	Device ID	Device ID of connected IO-Link device
Data[13]	Number of Diags	Event quantity*1
Data[14]	Event Qualifier 1	EventQualifier1*2
Data[15] - [16]	Event Code	Event code of IO-Link master or device*3
Data[17]	Event Qualifier 2	EventQualifier2*2
Data[18] - [19]	Event Code	Event code of IO-Link master or device*3
・・・	・・・	・・・

∗1: When the event quantity is "0", the data for Data[14] and later is not added. When the event quantity is "1", the total amount of Event Qualifier and event code 2 bytes (total bytes: 3) will be added. Data will be added by 3 bytes according to the event quantity.

∗2: The specifications of Event Qualifier# are described below.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Mode Type		Mode Type		Source	Instance		
0：Reserved 1：Event single shot 2：Event disappears 3：Event appears		0：Reserved 1：Notification 2：Warning 3：Error		0：Device 1：Master	0：Unknown 1-3：Reserved 4：Application 5-7：Reserved		

∗3: Refer to IO-Link master event code.
Refer to Operation Manual of IO-Link Device for details of the event code of the IO-Link device.

3. SMI_DeviceRead (ExpArgBlockID 0x3001)

[Request]

Data	Value	Note
Service code	0x32	
Class	0x90	
Instance	0x01 - 0x7F	Wireless channel
Attribute	0x65 - 0x68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x30	Fixed
Data[3]	0x00	Fixed
Data[4]	Index[0](MSB)	Refer to Operation Manual of IO-Link Device
Data[5]	Index[1](LSB)	
Data[6]	Subindex	Refer to Operation Manual of IO-Link Device

[Response]

Data	Value	Note
Ack[0] - [3]	0xB2000000	Successfully reading : 0xB2000000 Refer to the CIP error code
Data[0] - [#]	On request data	Refer to Operation Manual of IO-Link Device

4. SMI_DeviceWrite (ExpArgBlockID 0x3000)

[Request]

Data	Value	Note
Service code	0x33	
Class	0x90	
Instance	0x01 - 7F	Wireless channel
Attribute	0x65 - 68	Port number 1 - 4
Data[0]	0x00	Fixed
Data[1]	0x00	Fixed
Data[2]	0x30	Fixed
Data[3]	0x00	Fixed
Data[4]	Index[0](MSB)	Refer to Operation Manual of IO-Link Device
Data[5]	Index[1](LSB)	
Data[6]	Subindex	Refer to Operation Manual of IO-Link Device
Data[7] - [#]	On request data	Refer to Operation Manual of IO-Link Device

[Response]

Data	Value	Note
Ack[0] - [3]	0xB3000000	Successfully reading : 0xB2000000 Refer to the CIP error code

Modbus TCP / SLMP

To use asynchronous communication to read IO-Link master parameters, and read and write IO-Link device parameters.
The data format is shown below.

- Write：0x32
- Read ：0x33

The following 5 types of data can be read or written in the SMI service.

No	Description	Data type	Read	Write
1	SMI_MasterIdentification	IO-Link master information	○	―
2	SMI_PortConfiguration	IO-Link master port parameter setting	○	―
3	SMI_PortStatus	Acquires IO-Link master port status	○	―
4	SMI_DeviceRead	Receives ISDU from IO-Link device	○	―
5	SMI_DeviceWrite	Sends ISDU to IO-Link device	―	○

1. SMI_MasterIdentification (ExpArgBlockID 0x1001)

[Request]

Data	Value	Note
Service code	0x32	Service code, Read request
Parameter Unit ID	0x90	SMI service
WCh Number	0x01～0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x64	IO-Link Master
Channel Number	0x01	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Padding Data	0x00	Fixed

[Response]

Data	Value	Note
Parameter Unit ID	0x90	SMI service
WCh Number	0x01～0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x64	IO-Link Master
Channel Number	0x01	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Read Data Size	0x01 - 0xFF	Data Size［byte］
Data[0] - [1]	Reserved	Fixed 0x00
Data[2] - [3]	Vendor ID	IO-Link master vender ID(SMC：0x0083)
Data[4] - [7]	Master ID	IO-Link master ID (EX600-LAB1:0x0000003B,EX600-LBB1:10x0000003C)
Data[8]	Master type	IO-Link master type (0x02)
Data[9] - [10]	Feature	Functions that IO-Link master supports(0x0400)
Data[11]	Max number of ports	Maximum IO-Link port quantity of the IO-Link master (0x01, 0x02,0x03, 0x04)
Data[12]	Port 1 type	Port type 0x00：Class A(EX600-LAB1) 0x02：Class B(EX600-LBB1)
Data[13]	Port 2 type	
Data[14]	Port 3 type	
Data[15]	Port 4 type	
Padding Data	0x00	Fixed

2. SMI_PortConfiguration (ExpArgBlockID 0x8000)

[Request]

Data	Value	Note
Service code	0x32	Service code, Read request
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number
Channel Number	0x80	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Padding Data	0x00	Fixed

[Response]

Data	Value	Note
Parameter Unit ID	0x90	SMI service
WCh Number	0x01～0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x64	Port number 1-4
Channel Number	0x01	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Read Data Size	0x01 - 0xFF	Data Size［byte］
Data[0]	Port mode	0x00：Deactivated 0x01：IOL_Manual 0x02：IOL_Autostart 0x03：DI_C/Q 0x04：DQ_C/Q
Data[1]	Validation&Backup	0x00：No Device Check 0x01：Type compatible Device V1.0 0x02：Type compatible Device V1.1 0x03：Type compatible Device V1.1、Backup+Restore 0x04：Type compatible Device V1.1、Restore
Data[2]	I/Q behavior (Pin2 at M12 Connector)	0x01：Digital input(EX600-LAB1) 0x05：Power2(EX600-LBB1)
Data[3]	Port Cycle time	Port Cycle time
Data[4]～[5]	Vendor ID	Vendor ID for IO-Link device comparison function
Data[6]～[9]	Device ID	Vendor ID for IO-Link device comparison function
Padding Data	0x00	Fixed

3. SMI_PortStatus (ExpArgBlockID 0x9000)

[Request]

Data	Value	Note
Service code	0x32	Service code, Read request
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number 1-4
Channel Number	0x90	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Padding Data	0x00	Fixed

[Response]

Data	Value	Note
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number 1-4
Channel Number	0x90	Fixed
Index	0x00	Fixed
Subindex	0x00	Fixed
Read Data Size	0x01 - 0xFF	Data Size［byte］
Data[0]	Port Status Info	0x00：NO_DEVICE,0x01：DEACTIVATED 0x02：PORT_DIAG,0x03：PREOPERATE 0x04：OPERATE,0x05：DI_C/Q,0x06：DO_C/Q
Data[1].bit0	Port Quality Info input	0x00：Input process data valid 0x01：Input process data invalid
Data[1].bit1	Port Quality Info output	0x00：Output process data valid 0x01：Output process data invalid
Data[2]	Revision ID	IO-Link device revision ID
Data[3]	Transmission Rate	Communication speed 0x00：NOT_DETECTED,0x01：COM1,0x02：COM2 0x03：COM3
Data[4]	Master Cycle Time	Port cycle time
Data[5]	Input Data Length	Process input data length of connected IO-Link device
Data[6]	Output Data Length	Process Output data length of connected IO-Link device
Data[7] - [8]	Vendor ID	Vendor ID of connected IO-Link device
Data[9] - [12]	Device ID	Device ID of connected IO-Link device

[Response] (continued)

Data	Value	Note
Data[13]	NumberOfDiags	Event quantity*1
Data[14]	EventQualifier 1	EventQualifier1*2
Data[15] - [16]	EventCode	Event code of IO-Link master or device*3
Data[17]	EventQualifier 2	EventQualifier2*2
Data[18] - [19]	EventCode	Event code of IO-Link master or device*3
・・・	・・・	・・・
Data[n-2]	EventQualifier n	EventQualifier n*2
Data[n-1] - [n]	EventCode for n	Event code of IO-Link master or device*3

*Data[0]～Data[n] is big endian, because of SMI specification.

∗1: When the event quantity is "0", the data for Data[14] and later is not added. When the event quantity is "1", the total amount of EventQualifier and event code 2 bytes (total bytes: 3) will be added. Data will be added by 3 bytes according to the event quantity.

∗2: The specifications of EventQualifier# are described below.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Mode		Type		Source	Instance		
0：Reserved 1：Event single shot 2：Event disappears 3：Event appears		0：Reserved 1：Notification 2：Warning 3：Error		0：Device 1：Master	0：Unknown 1-3：Reserved 4：Application 5-7：Reserved		

∗3: Refer to IO-Link master event code.

Refer to Operation Manual of IO-Link Device for details of the event code of the IO-Link device.

4. SMI_DeviceRead (ExpArgBlockID 0x3001)

[Request]

Data	Value	Note
Service code	0x32	Service code, Read request
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number 1-4
Channel Number	0x90	Fixed
Index[0](MSB)	***	Refer to Operation Manual of IO-Link Device
Index[1](LSB)	***	Refer to Operation Manual of IO-Link Device
Subindex	***	Refer to Operation Manual of IO-Link Device
Padding Data	0x00	Fixed

[Response]

Data	Value	Note
Parameter Unit ID	0x90	SMI service
WCh Number	0x01～0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x64	Port number 1-4
Channel Number	0x01	Fixed
Index[0](MSB)	***	Refer to Operation Manual of IO-Link Device
Index[1](LSB)	***	Refer to Operation Manual of IO-Link Device
Subindex	***	Refer to Operation Manual of IO-Link Device
Read Data Size	0x01 - 0xFF	Data Size［byte］
Data[0]～[#]	On request data	Refer to Operation Manual of IO-Link Device

5. SMI_DeviceWrite (ExpArgBlockID 0x3000)

[Request]

Data	Value	Note
Service code	0x33	Service code, Read request
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number 1-4
Channel Number	0x30	Fixed
Index[0](MSB)	***	Refer to Operation Manual of IO-Link Device
Index[1](LSB)	***	Refer to Operation Manual of IO-Link Device
Subindex	***	Refer to Operation Manual of IO-Link Device
Write Data Size	0x01 - 0xFF	Data Size［byte］
On request data	***	Refer to Operation Manual of IO-Link Device
Padding Data	0x00	Fixed

[Response]

Data	Value	Note
Parameter Unit ID	0x90	SMI service
WCh Number	0x01 - 0x7F	Wireless channel
Parameter No.	0x00	Fixed
Unit Number	0x65 - 0x68	Port number 1-4
Channel Number	0x30	Fixed
Index[0](MSB)	***	Refer to Operation Manual of IO-Link Device
Index[1](LSB)	***	Refer to Operation Manual of IO-Link Device
Subindex	***	Refer to Operation Manual of IO-Link Device

How to Pair/Unpair

How to Pair

Pairing the Base and Remote

Pairing is required for wireless communication between the base and the remote.
To pair the base unit and the remote, set both the base unit and the remote to pairing mode.
Pairing and registering the Base and Remote units enables wireless communication.

○ Operation Flow for Pairing Setup

① Switch the Remote to Pairing Mode

↓

② Switch the base unit to pairing mode
*The device will switch to pairing mode using the selected wireless protocol.

↓

③ Pair and register the base unit and the remote unit

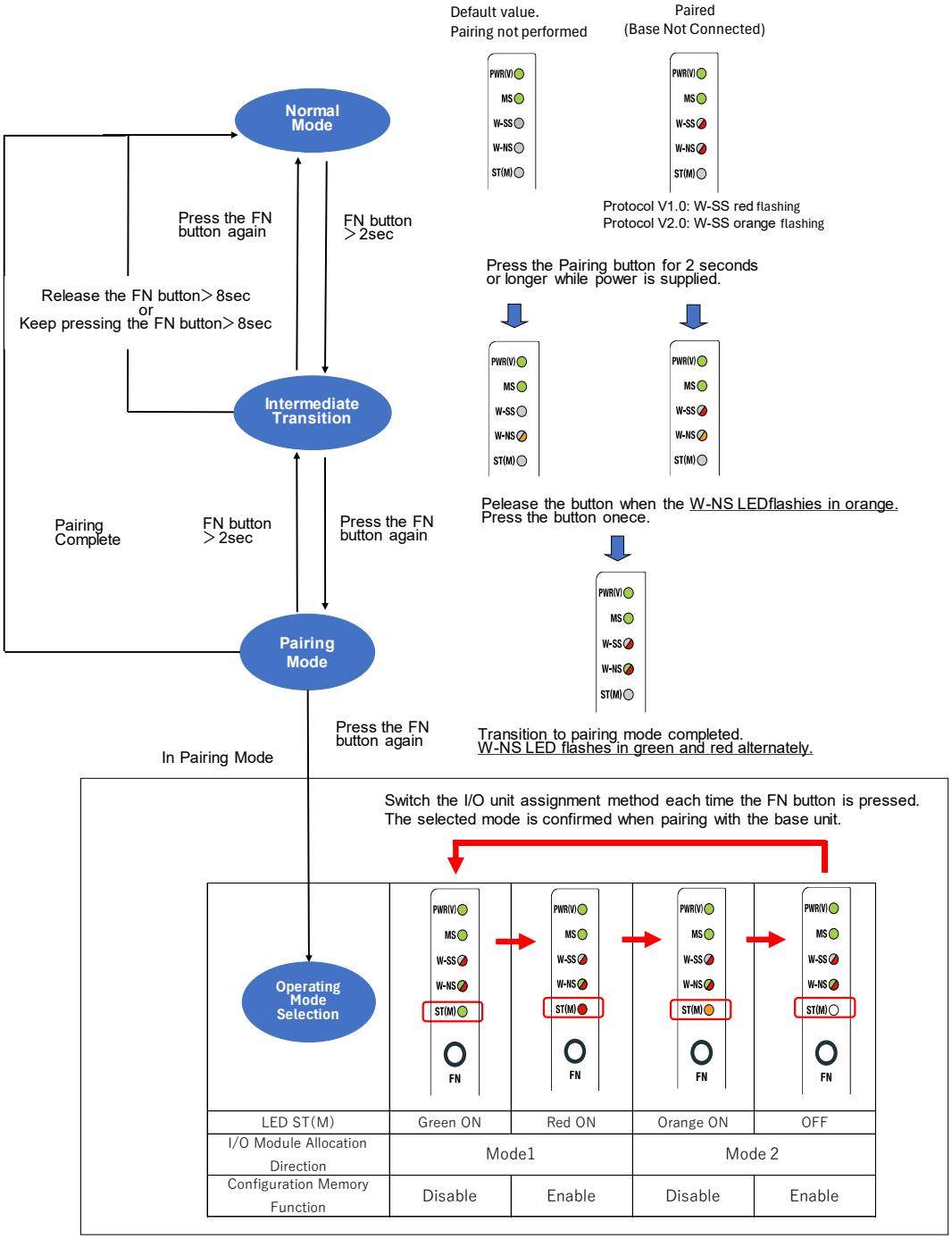
↓

④ Switch the base unit to non-pairing mode
*The remote will automatically switch to non-pairing mode.

- Be sure to perform pairing while both the base unit and the remote are powered on.
- After switching the operating mode in the pairing settings, pressing the [Reset] button or turning the power off and back on will change the mode, putting the unit into a state where it awaits registration or connection with the remote.

①Switch the remote to pairing mode

Press the FN button on the remote to switch to pairing mode.



- The remote's IO unit assignment direction and configuration memory function are parameters selected during pairing mode.

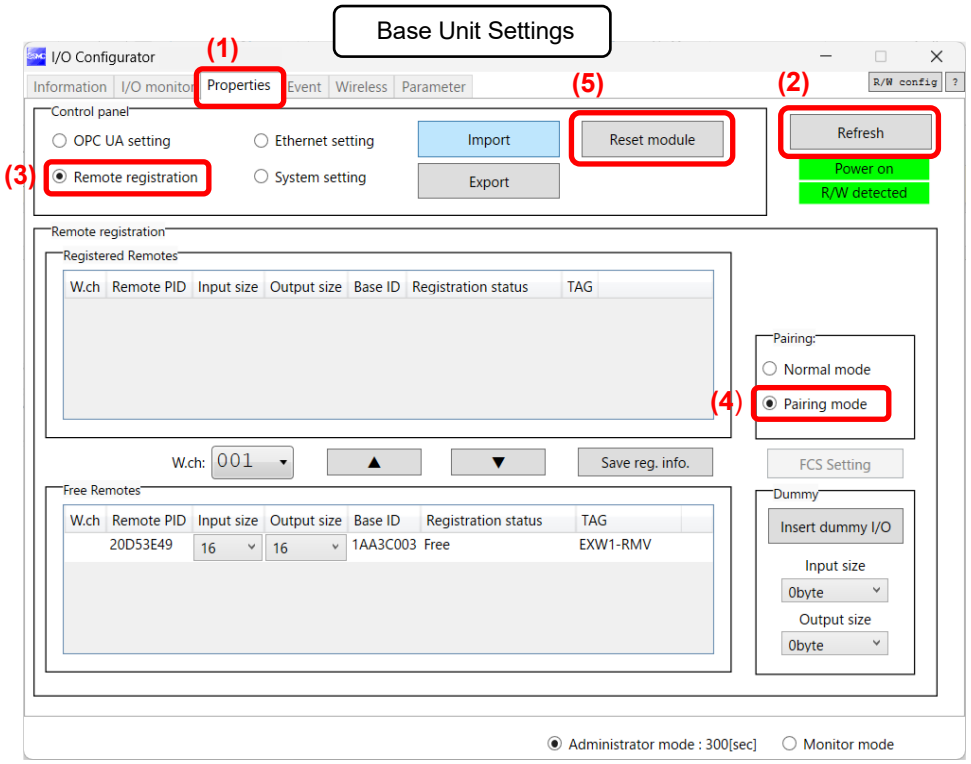
During pairing, pressing the FN button changes the operating mode combination, and the device will operate in the mode selected when pairing with the base is confirmed.

Please note that the configuration memory function is supported only by wireless protocol V.2.0;the settings will not be applied.

② Switch the base to pairing mode

Switch the base to pairing mode. Select the [Settings] tab and click [Refresh]. From [Remote Unit Registration] on the [Settings] tab, select [Pairing mode] and click [Reset].

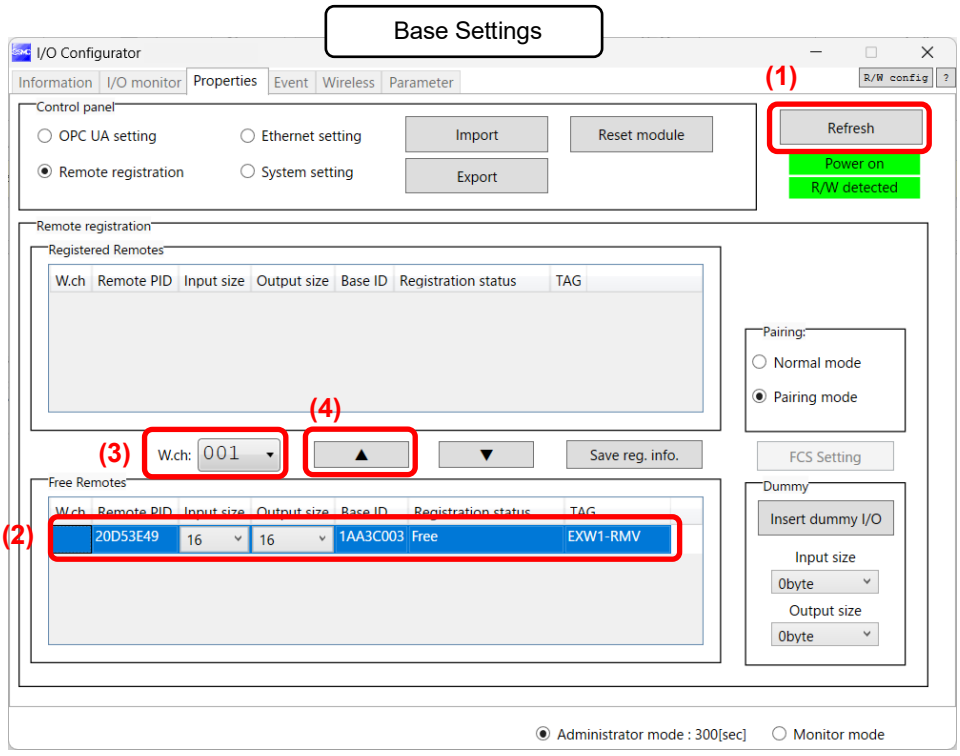
***Since the base switches to pairing mode using the wireless protocol set in System Settings, please switch to pairing mode using the wireless protocol appropriate for the remote unit you wish to pair.**



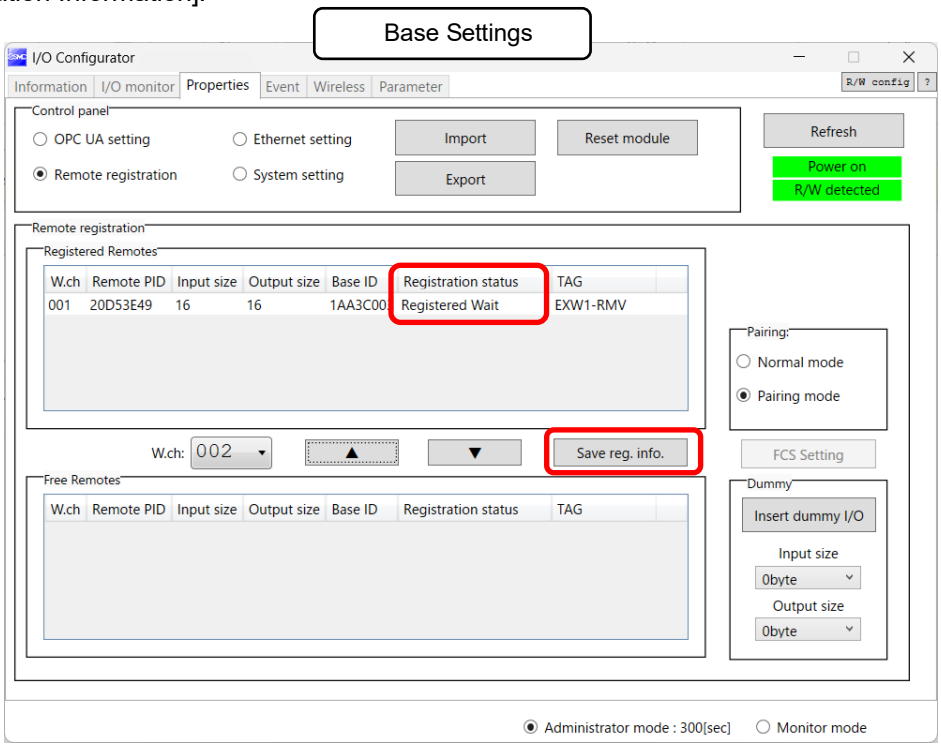
③ Pair and register the base unit and the remote

Click [Refresh] to display remotes in pairing mode in the "Free Remotes" section. Select the remote you want to register, set the wireless channel, and click ▲.

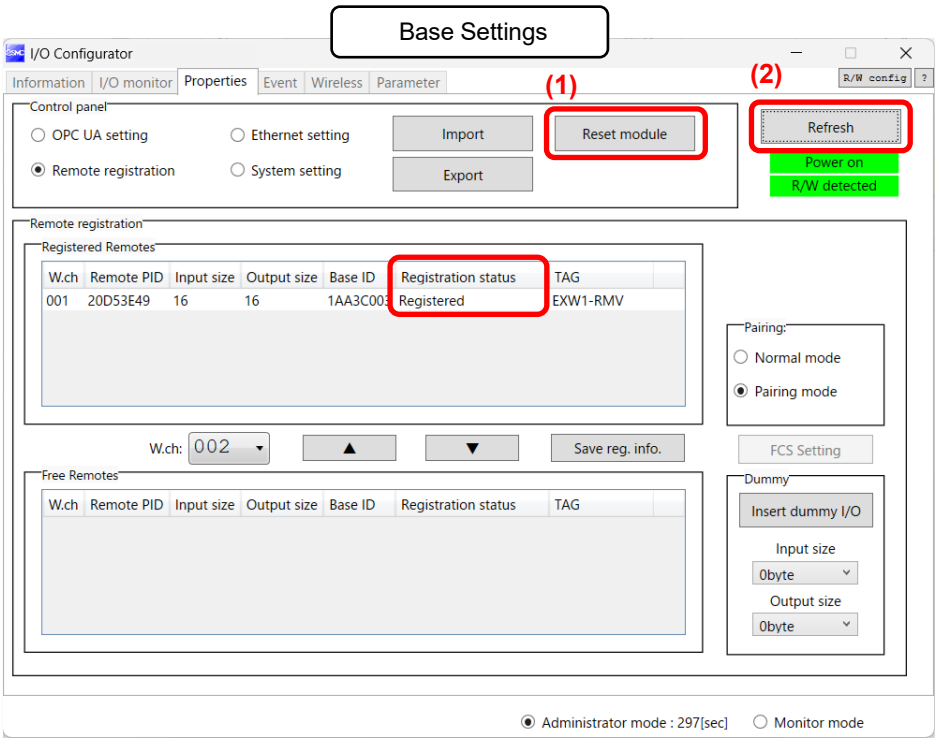
If the remote you want to pair with does not appear, click [Refresh] again. If it still does not appear, it may be because: **1. The remote has not switched to pairing mode**, **2. The remote is not turned on**, or **3. It is already registered with or waiting to be registered to another base**.



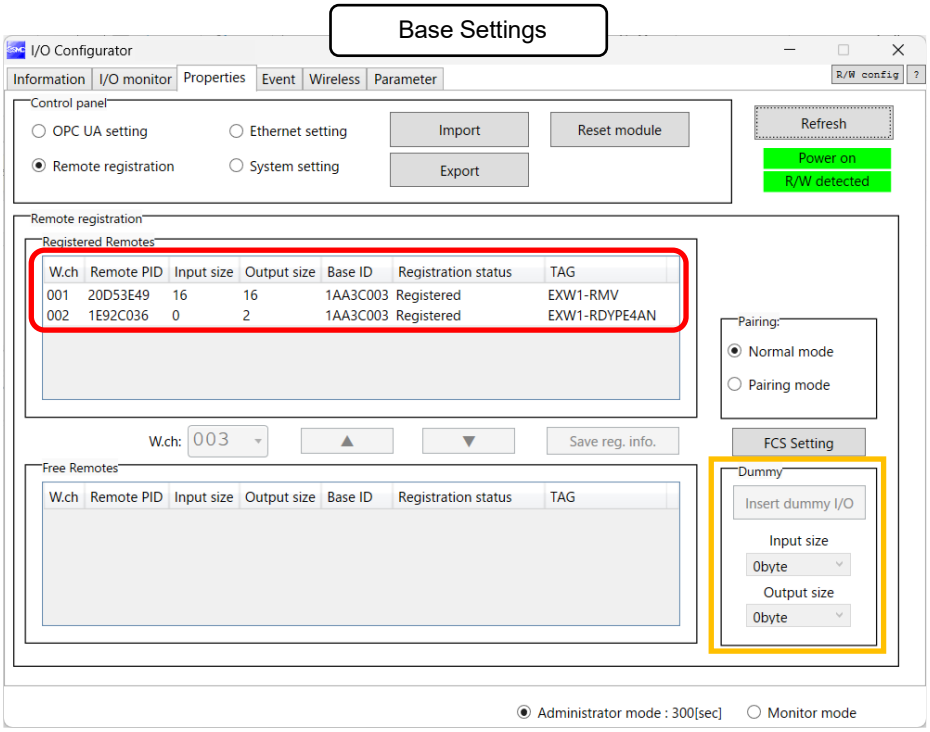
The remote you want to register on the specified wireless channel will move to the "Registered Remotes" section. Confirm that the registration status is "Pending Registration," then click [Save Registration Information].



Click [Reset] and [Refresh], then confirm that the registration status changes to “Registered.”



*The example below shows two remote modules registered to CH1 and CH2.



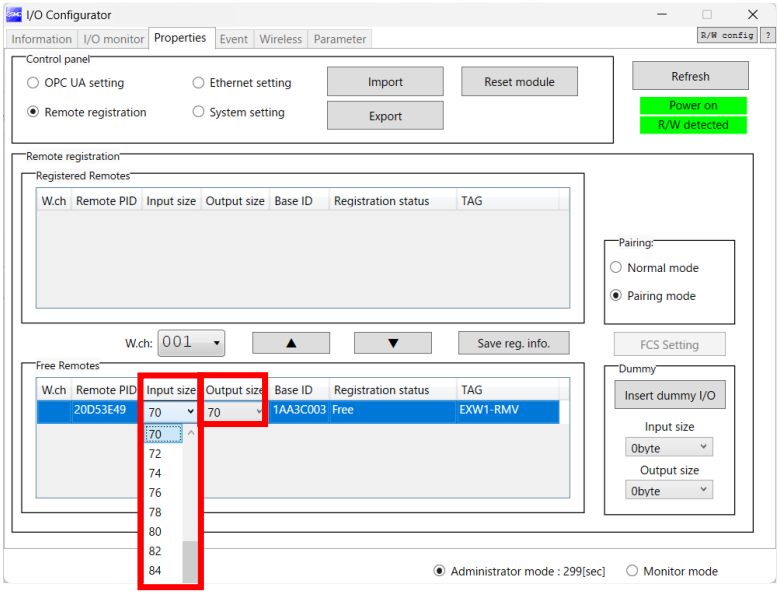
Please configure the registration of dummy remotes as needed.

Input Size/Output Size Settings

This remote can be used with variable input and output size byte allocations.
The range of bytes occupied and the configuration method vary depending on the wireless protocol version.

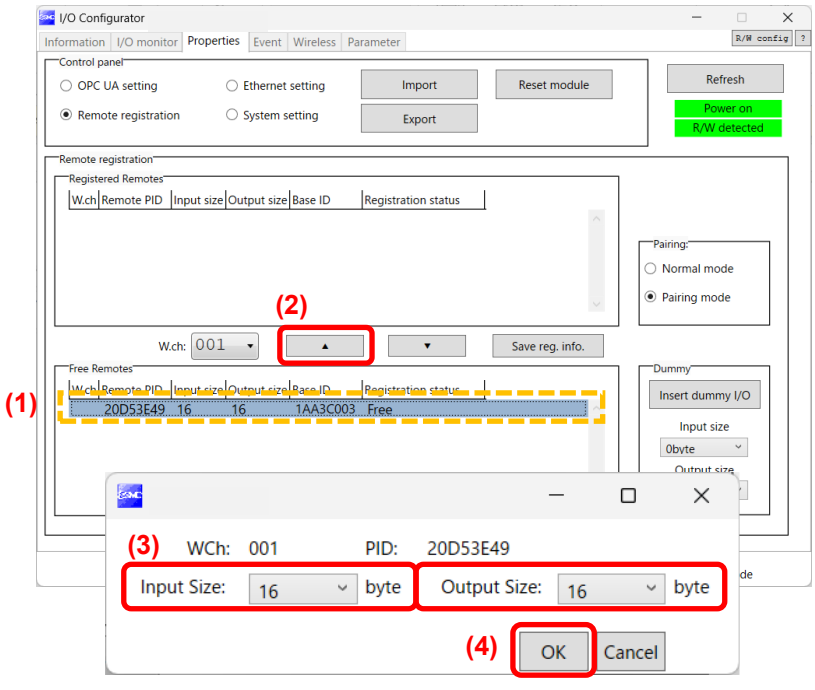
・For Wireless Protocol V.2.0

Select the remote displayed in the “Free Remote” field; input size and output size settings can be selected from the drop-down menu.

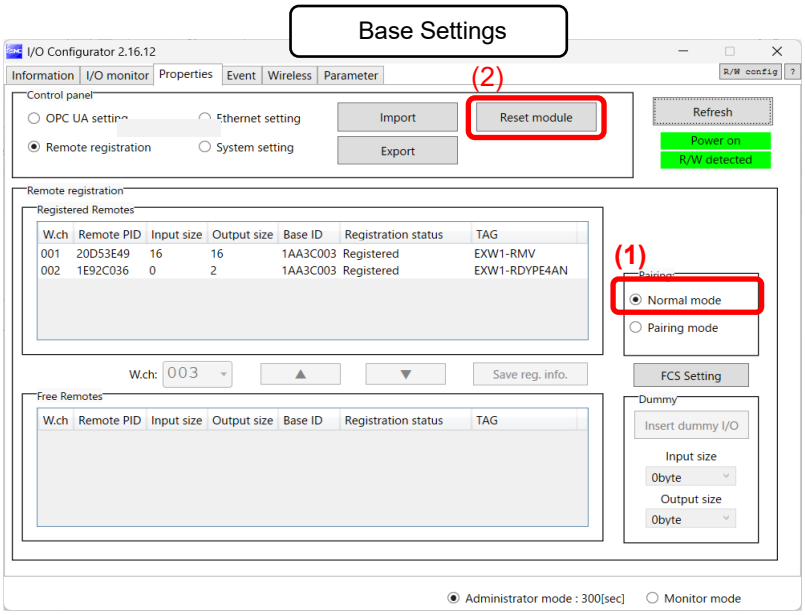


・For Wireless Protocol V.1.0

Select a remote from the "Free Remote" field and click "▲" to display the "Input Size/Output Size" settings tab will appear.
After setting each size, click the “OK” button to move the selected will be moved to the “Registered Remotes” section.



④ Disable pairing mode on the base unit (set to non-pairing mode)
Set the base to non-pairing mode, then click [Reset].



・About Dummy Remotes

The dummy remote feature allows you to register a "dummy area" within the I/O map. Even after the system has been configured, you can add remotes by registering them in the "dummy area" without having to modify the I/O map.

The order in which remotes are assigned to the I/O map is determined by the radio channel set during remote registration; they are assigned in ascending order of channel number, starting from the lowest-numbered registered channel.
In this process, radio channels to which no remotes are registered are ignored.

When adding a new remote, you may need to modify the I/O map depending on the wireless channel number.
Note that dummy remotes can only be registered on the base unit.

・To register a dummy remote, you must first set the number of input/output points.
Please note that if you register a remote with a different number of input/output points than those set, you will need to modify the I/O map

Precautions for pairing

If any of the following errors have occurred on the remote, pairing with the base unit will not be possible.
If any of the applicable errors have occurred, clear the errors before performing pairing with the base unit

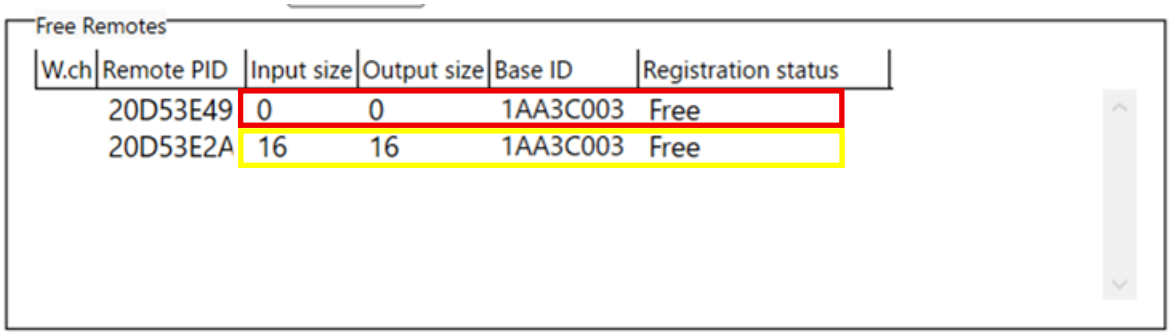
Wireless Protocol V.2.0

Error name	Description	LED status		
		name	color	ON/OFF Flashing
IO-Link master connection count error	Two or more IO-Link master modules are connected.	MS	Red	Flashing
Connection count error	The number of connected units exceeds the allowable limit, or an unsupported module is connected.	MS	Red	Flashing

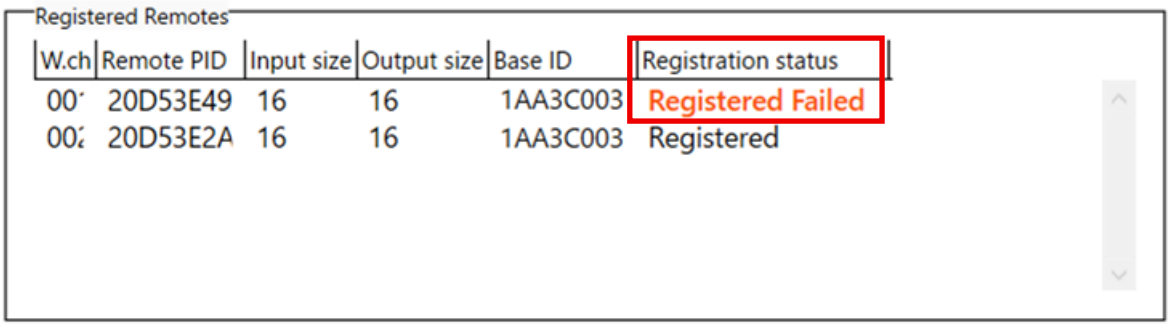
Wireless Protocol V.1.0

Error name	Description	LED status		
		name	color	ON/OFF Flashing
IO-Link master connection count error	One or more IO-Link master modules are connected.	MS	Red	Flashing
Connection count error	The number of connected units exceeds the allowable limit, or an unsupported module is connected.	MS	Red	Flashing

If pairing is performed under the above conditions, the remote's input size/output size will be displayed as "0 byte" in the free remote field.



After setting the input size and output size and attempting registration, it will always result in "Registration failed," and pairing will not be completed successfully. Please take note.



How to Unpair

Unpairing the Base and Remote

Unpair the base unit and remote.

If you wish to change the I/O size of a registered remote control, or if you need to modify the wireless system configuration in any other way, you must unpair the devices and re-register them.

○ Procedure for Unpairing

① Switch the Base to Pairing Mode

↓

② Unpair the base unit and remote

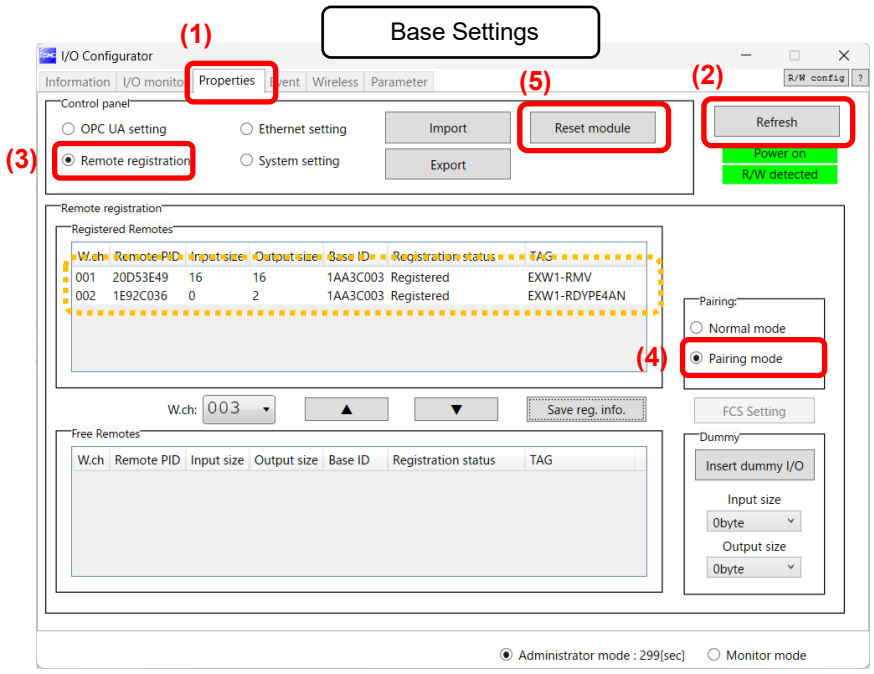
↓

③ Exit the base unit's pairing mode (set to non-pairing mode)

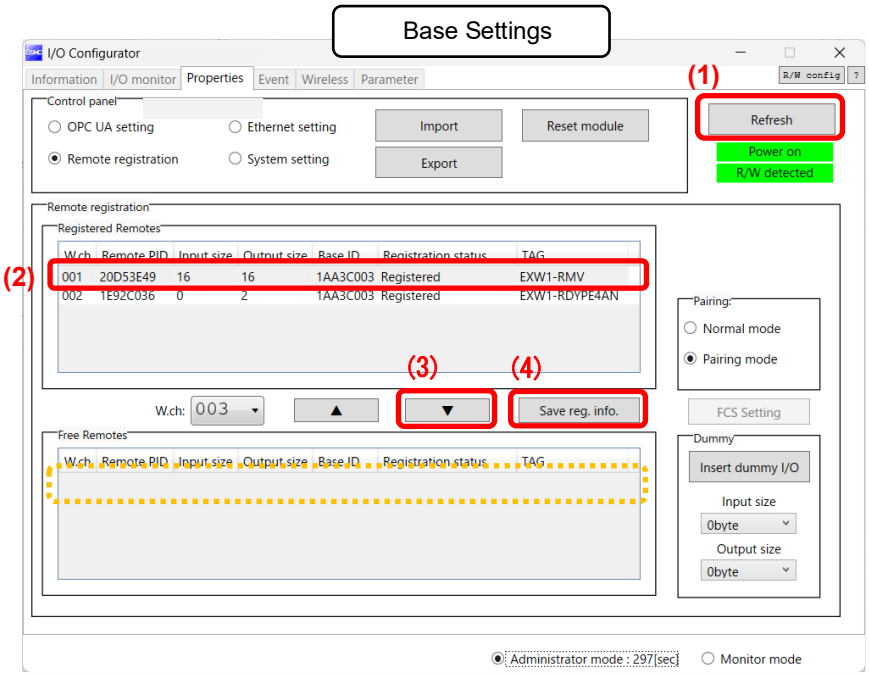
① Switch the base unit to pairing mode

Switch the base unit to pairing mode. Select the [Settings] tab and click [Refresh].

Under [Remote Unit Registration] on the [Settings] tab, select [Pairing mode] and click [Reset].



② Unpair the Base and Remote
Unpair the base and the remote.
Click [Refresh]. Select the remote you want to unpair from the list of registered remotes, then click ▼ to move the selected remote to the "Free Remotes" section.
Click [Save Registration Information] to confirm the unpairing of the remote.



- If a remote moved to the "Free Remotes" section is not in pairing mode, clicking [Refresh] after confirming the remote unregistration will cause the remote moved to the "Free Remotes" section to disappear.

③ Set the base unit to non-pairing mode
Set the base to non-pairing mode, then click [Reset].

Troubleshooting

When problems occur, take appropriate countermeasures while referring to the LED indication, troubleshooting and parameter settings.
If a cause applicable to the failure cannot be identified, this indicates that the equipment itself is broken. The fieldbus system damage can be caused by the operating environment. Contact SMC to obtain countermeasures.

・Remote Troubleshooting Items

LED	Description	LED Status		No.
		LED Color	ON/OFF Flashing	
-	All LEDs are off	-	-	Trouble 1
PWR (V)	Any light other than green	Green	Flashing	Trouble 2
		Red	Flashing	
		-	OFF	
MS	Any light other than green	Green	Flashing	Trouble 3
		Red	Flashing	
		Red	ON	
		Orange	Flashing	
		-	OFF	
W-SS	Red flashing, orange flashing, or off	Red	Flashing	Trouble 4
		Orange	Flashing	
		-	OFF	
W-MS	Any light other than green	Red	Flashing	Trouble 5
		Red	ON	
		Red / Green	Alternating Flash	
		Orange	ON	
		-	OFF	
ST(M)	Any color other than solid green	Red	ON	Trouble 6
		-	OFF	

・Remote Troubleshooting

No.	LED Name	LED Status		Possible causes	Investigation and countermeasures
		LED Color	ON/OFF Flashing		
1	All	-	OFF	The US1 (for control) power supply is OFF	Supply 24 VDC +/-10% for US1 (for control) power source.
2	PWR (V)	Green	Flashing	US2 (for output) Power supply voltage drop (when voltage monitoring is enabled)	The supply voltage of the US2 (for output) power supply has dropped. Please supply 24VDC ±10%. **When using Wireless Protocol V.2.0**
		Red	Flashing	US2 (for output) Power supply voltage drop (when voltage monitoring is enabled)	The supply voltage of the US2 (for output) power supply has dropped. Please supply 24VDC ±10%. **When using Wireless Protocol V.1.0**
		-	OFF	(1) US2 (for output) Power Supply Voltage drop. (When voltage monitoring is disabled) (2) US1 (Control and Input) Power OFF	(1) The supply voltage for the US2 (for output) power supply has dropped. Please supply 24VDC ±10%. Alternatively, enabled the power supply monitoring setting. (2) US1 (Control and Input) Please supply 24VDC ±10% to the power supply.

・Remote Troubleshooting

No.	LED Name	LED Status		Possible causes	Investigation and countermeasures
		LED Color	ON/OFF Flashing		
3	MS	Green	Flashing	US1(Control and Input) Low Power Supply Voltage	US1 (Control and Input) supply 24 VDC ±10% to the power supply.
		Red	Flashing	The following diagnostic information was detected	Determine the nature of the error using system diagnostic information and LED indicators, and refer to the countermeasures below.
				(1) Excessive IO setting inputs/outputs	(1) The number of module IO points exceeds the set value. Check the number of bytes occupied by the EX600 IO modules and valve manifolds connected to the remote unit.
				(2) Module connection error	(2) The number of connected modules exceeds the limit, or an unsupported module is connected. Please review the configuration.
				(3) Inter-module communication error	(3) Check that there are no loose connections between the units and ensure they are connected correctly.
				(4) Diagnostic information detected on the EX600 I/O module ④-1 Short circuit in the Control and Input (US1) power supply voltage ④-2 Short circuit in the output (US2) power supply voltage ④-3 Output Load Short Circuit ④-4 Analog Unit User-Set Value Exceeds Upper or Lower Limit ④-5 Analog Unit Input/Output Range Upper/Lower Limit Exceeded	(4) Check that the connections between each unit are secure, and ensure they are connected correctly. Use the LED indicators and the system information in the system diagnostics to identify the error location, and refer to the instruction manuals for the digital and analog units.
				(5) Communication error between wireless adapters Internal Communication Error	(5) Communication with the wireless adapter is not functioning properly. Check for loose connectors or broken wires.

・Remote Troubleshooting (continued)

No.	LED Name	LED Status		Possible causes	Investigation and countermeasures
		LED Color	ON/OFF Flashing		
3	MS	Red	ON	Remote malfunction	Please replace the remote. If the problem persists even after replacement, please stop using the device and contact our sales representative.
		Orange	Flashing	Wireless adapter not connected	Please connect the wireless adapter.
		Off	OFF	US1 (Control and Input) Power OFF	US1 (for Control and Input) Supply 24VDC ±10%.
4	W-SS	Red	Flashing	Base not connected for Protocol V.1.0 (1) Base unit power OFF (2) Out of wireless range	(1) Supply 24VDC ±10% to the base's US1 (Control and Input) power supply. (2) The distance may exceed the range for wireless communication between the wireless systems. Please re-evaluate the operating environment (installation conditions, etc.) for the base and remote units.
		Orange	Flashing	Base not connected under Protocol V.2.0 (1) Base unit power is off (2) Out of wireless range	(1) Supply 24VDC ±10% to the base's US1 (Control and Input) power supply. (2) The distance may exceed the range for wireless communication between the wireless systems. Please reevaluate the operating environment (installation conditions, etc.) for the base and remote units.
		-	OFF	(1) US1 (Control and Input) Power OFF (2) Base not registered	(1) US1 (Control and Input) Please supply 24VDC ±10% to the power source. (2) Check the base's registration status and perform pairing correctly.

・Remote Troubleshooting (continued)

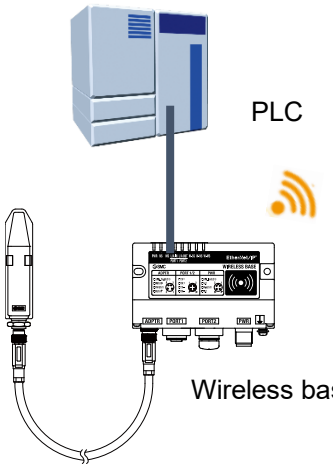
No.	LED Name	LED Status		Possible causes	Investigation and countermeasures
		LED Color	ON/OFF Flashing		
5	W-NS	Red	Flashing	Base not connected (1) Base power OFF (2) Out of wireless range	(1) Supply 24VDC ±10% to the base's US1 (Control and Input) power supply. (2) The distance may exceed the range for wireless communication between the wireless systems. Please reevaluate the operating environment (installation conditions, etc.) for the base and remote units.
		Red	ON	Remote malfunction	Please turn the power off and then back on. If the problem persists after restarting, please replace the remote. If the problem persists even after replacement, please stop using the device and contact our sales representative.
		Red / Green	Alternating flashes	In pairing mode	Set to "Ready to Pair". If, please change the setting to.
		Orange	Flashing (1Hz)	FN (Pairing button) in use	The FN button is being pressed. Please change the mode according to your usage.
		Orange	ON	Forced Output Mode	The unit is in forced output mode. Please change the mode according to your intended use.
		-	OFF	(1) US1 (Control and Input) Power OFF (2) Base not registered	(1) US1 (for Control and Input) Supply 24VDC ±10% to the power supply. (2) Check the base's registration status and perform the pairing procedure correctly.
6	ST(M)	Red	Flashing	Configuration Memory Error	There is a discrepancy with the module configuration saved during pairing. Please check the registered configuration and correct it. Alternatively, perform pairing again and re-register the configuration.

Technical Information

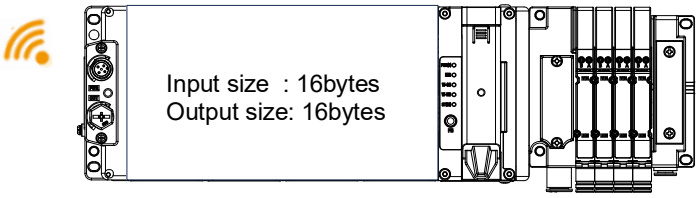
Configuration Storage Function

The EXW1 Remote Modular Type has a function that stores the configuration (model identification, connection order, etc.) of the EX600 I/O modules connected to it when pairing with a wireless base station.

By using the configuration memory function, it is possible to diagnose which unit or channel connected remotely from the host communication system (such as a PLC) is experiencing an error when an error occurs.It is also possible to output an error when the configuration changes due to the addition, removal, or rearrangement of units.

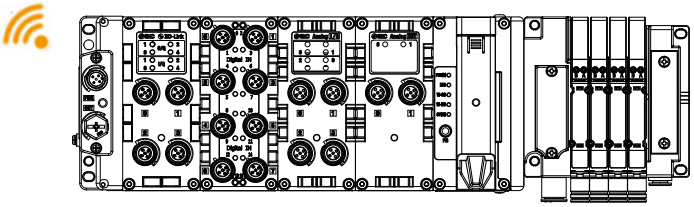


Configuration Memory Mode: **Disable**



From the upstream side, it is recognized as a single module with the configured input/output size

Configuration Memory Mode: **Enable**



The host system can recognize the module configuration (model, connection order)

Differences in Specifications Depending on the Configuration Memory Function Setting (Enabled/Disabled)

Item		Wireless Protocol V.2.0	
		Configuration Memory "Disabled"	**Configuration Memory "Enable"**
Specifications	Number of EX600 IO Modules That Can Be Connected*1	Up to 9 units	Up to 8 units

*1: For details, refer to the section on the number of EX600 IO modules that can be connected in the technical documentation.(page197)

Differences in Functionality Based on the Configuration Memory Function Setting (enabled/disabled)

Item					Wireless Protocol V.2.0	
					Configuration Memory "Disabled"	**Configuration Memory "Enable"**
Settings (Parameters)	Remote (Main Unit)	Parameter		IO Configurator	○	○
		Valve Output			○	○
		ON/OFF Count			○	○
	EX600 IO Module	General-Purpose Input/Output Unit			○	○
		IO-Link Master	Main Unit		○	○
			IO-Link Device	IO-Link Device Tool	○*1	○*1
	Remote (Main Unit)	Parameter		Asynchronous Communication	×	○
		Valve Output			×	×
		ON/OFF Count			×	○
	EX600 IO Module	General-Purpose Input/Output Unit			×	×
		IO-Link Master	Main Unit		△*2	△*2
			IO-Link Device		○*3	○*3
Diagnosis	Remote (Main Unit)	Parameter		IO Configurator	○	○
		Valve Output			○	○
		ON/OFF Count			○	○
	EX600 IO Module	General-Purpose Input/Output Unit			○	○
		IO-Link Master			○	○
	Remote (Main Unit)	Parameter		Asynchronous Communication	×	○
		Valve Output			×	○
		ON/OFF Count			×	○
	EX600 IO Module	General-Purpose Input/Output Unit			×	○
		IO-Link Master			×	○

*1: The wireless-based EXW1-BMJA# and EXW1-BDNAC models are not supported.
*2: Only one set of parameters can be configured.
*3: The wireless-based EXW1-BMJA# is not supported.

Number of EX600 IO Modules That Can Be Connected

The number of EX600 IO modules that can be connected to the EXW1 Remote Modular Type may be reduced depending on the wireless protocol version and the following conditions.

[Wireless Protocol V.2.0]

When the configuration memory function is set to **"Disable"**

Condition 1: Connection of up to **9** EX600 Series IO modules. (Excludes valve manifolds.)
However, only one IO-Link master may be connected.

Condition 2: The total number of IO points occupied by the connected EX600 IO modules must be less than or equal to the number of remote IO points.

Condition 3: The total number of slots occupied by the connected EX600 I/O modules must be **10 or fewer** (Including valve outputs.)

Slot Diagram

Slot1	Slot2	Slot3	Slot4	Slot5	Slot6	Slot7	Slot8	Slot9	remote EXW1-RMV#	Slot10
										valve output

When the configuration memory function is set to **"Enable"**

Condition 1: Connection of up to **8** EX600 Series IO modules. (Excludes valve manifolds.)
However, only one IO-Link master may be connected.

Condition 2: The total number of points occupied by the connected EX600 IO modules must be less than or equal to the number of remote input/output points.

Condition 3: The total number of slots occupied by the connected EX600 IO modules must be **9 or fewer** (Including valve outputs.)

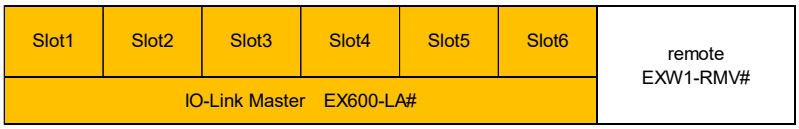
Slot Diagram

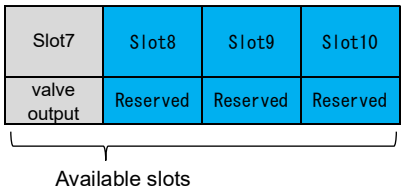
Slot1	Slot2	Slot3	Slot4	Slot5	Slot6	Slot7	Slot8	remote EXW1-RMV#	Slot9
									valve output

Example 1) When using only an IO-Link master unit

Connection of one EX600 IO-Link master unit: 6 slots

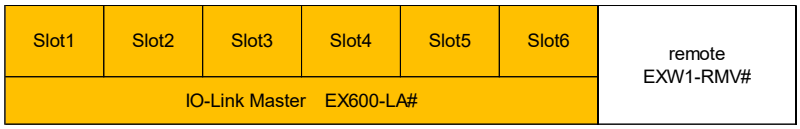
・Configuration storage function: “Disable”





EX600 IO modules can be assigned to the remaining 4 slots.

・Configuration memory function: “Enable”



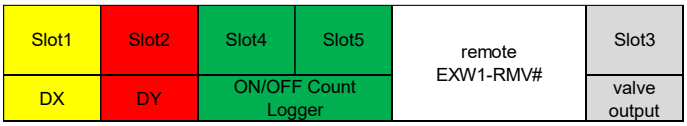


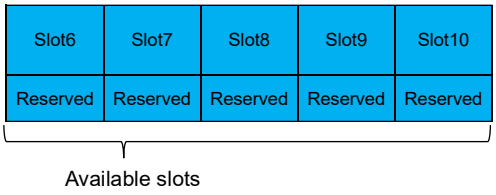
EX600 IO modules can be assigned to the remaining 3 slots.

Example 2) When using input/output units and valve outputs, where the **ON/OFF Count function is enabled.**

Connection of one EX600 digital input unit : 1 slot
Connection of one EX600 digital output unit : 1 slot
EXW1-RMV# Valve Output : 1 slot
ON/OFF Count Function : 2 slots

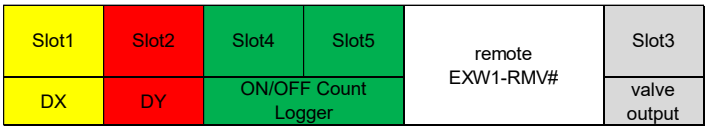
・Configuration Memory Function: “Disable”

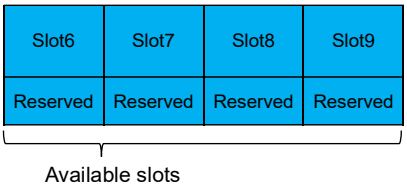




EX600 IO modules can be assigned to the remaining 5 slots.

・Configuration memory function: “Enable”



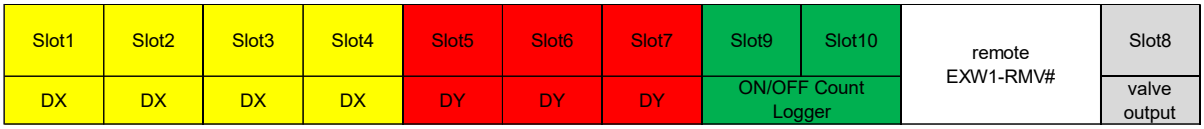


EX600 IO modules can be assigned to the remaining 4 slots.

Example 3) When using both input and output units, depending on whether the configuration memory function is enabled or disabled, **the ON/OFF Count unit differ depending on whether the configuration memory function is enabled or disabled.**

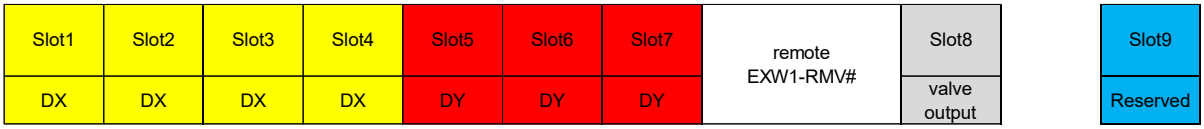
Connection of 4 EX600 digital input units : 4 slots
Connection of 3 EX600 digital output units : 3 slots
EXW1-RMV# Valve Output : 1 slot

・Configuration Save Function: “Disable”



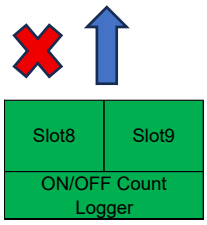
ON/OFF Count function is enabled; an EX600 IO module can be assigned to a single slot.

・Configuration Memory Function: “Enable”



The ON/OFF Count function is disable; one EX600 IO module can be assigned to a single slot.

Since there is only one available slot, the ON/OFF Count



●Note
・The ON/OFF Count function is automatically assigned to a slot under the following conditions:
1) When using wireless protocol V.2.0
2) When one or more digital input modules are connected
3) When there are two or more empty slots

*The ON/OFF Count function cannot be used if there are two or fewer empty slots.
In addition, since the EX600 I/O module slot allocation is prioritized, if the number of available slots is reduced to two or fewer due to the addition of modules or other changes, the ON/OFF Count function may be removed.
・Please refer to the I/O map for the number of points occupied and the number of slots for each EX600 IO module.(page200)

[For Wireless Protocol V.1.0]

Condition 1: Connection of up to 9 EX600 Series IO modules. (Excluding valve manifolds.)
Connection of an IO-Link master is not supported.

Condition 2: The total number of points occupied by the connected EX600 IO modules is less than or equal to the number of remote input/output points

IO Map

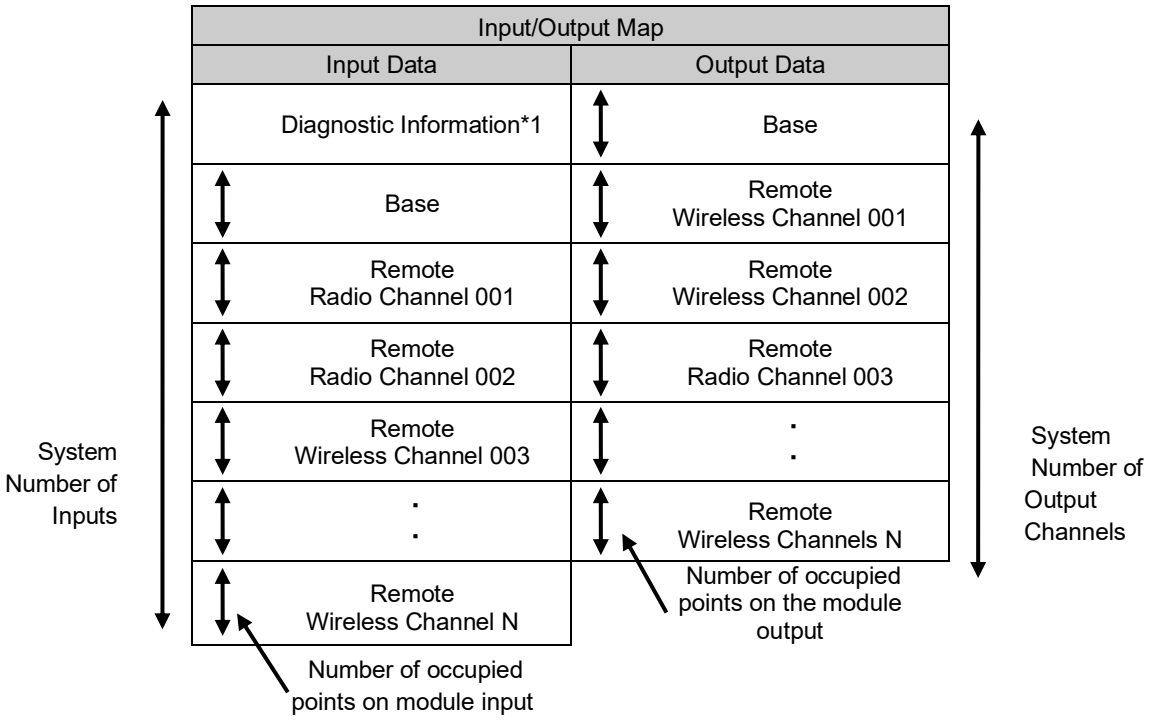
Number of Bytes Allocated for Input/Output on Remote and EX600 IO Modules

The table below shows the number of bytes occupied by the Input/Output of EX600 IO modules that can be connected to the remote unit.

Unit Name	Model	Unit Part Number	Wireless Protocol V.2.0			Wireless Protocol V.1.0	
			Number of bytes occupied		Slot Number	Number of bytes occupied	
			Input	Output		Input	Output
Remote	RMV	EXW1-RMV# (0–32 points)	0	0–4	1	0	0–4
		ON/OFF Count Function Logger Function	2	0	2	Not applicable	
Digital Input Module	DX	EX600-DX#B (8 points)	1	0	1	1	0
		EX600-DX#C (8 points)	1	0	1	1	0
		EX600-DX#C1 (8-point) (with wire break detection)	1	0	1	1	0
		EX600-DX#D (16 points)	2	0	1	2	0
		EX600-DX#E (16 points)	2	0	1	2	0
		EX600-DX#F (16 points)	2	0	1	2	0
Digital Output Module	DY	EX600-DY#B (8 points)	0	1	1	0	1
		EX600-DY#E (16 points)	0	2	1	0	2
		EX600-DY#F (16 points)	0	2	1	0	2
Digital I/O Module	DM	EX600-DM#E (8/8 points)	1	1	1	1	1
		EX600-DM#F (8/8 points)	1	1	1	1	1
Analog Input Module	AX	EX600-AXA (2 channels)	4	0	1	4	0
		EX600-AXB (4 channels)	8	0	1	8	0
Analog Output Module	AY	EX600-AYA (2 channels)	0	4	1	0	4
Analog Input/Output Module	AM	EX600-AMB (2/2 channels)	4	4	1	4	4
IO-Link Master Module	LA	EX600-LAB1 (0–1072 points)	0–134	0–134	6	Not applicable	
	LB	EX600-LBB1 (0–1072 points)	0–134	0–134	6	Not applicable	

Regarding IO Map Allocation

The I/O map is assigned in order of diagnostic information and remote. The remote allocation order to the I/O map is decided by the wireless channel at the remote registration. As they are allocated from the smallest registered channel number, the channel in which no remote is registered will be ignored. (Refer to the figure below.)



*1: This value may change depending on the diagnostic assignment settings in the base configuration parameters. For details, refer to the "Diagnostic Assignment" section.

Remote IO Assignment Order

Please note that the assignment order of EX600 IO modules and valve manifolds connected remotely depends on the IO module assignment direction setting.
The following shows an example of IO map assignment.

Mode 1: **Assignment from the end plate toward the right**
Mode 2 : **Assigned from the remote side toward the left**

<Example 1>

・For Mode 1

	Unit 0	Unit 1	Unit 2	Unit 3	
End Plate	DY#B Digital Output 1 byte Output	AXA Analog Input 4 bytes Input	DX#D Digital Input 2 bytes Input	EXW1-RMV# Remote 4 bytes Output	Valve Manifold (32 points)

●Remote parameter settings
Input size: 128 points/16 bytes
Output size: 128 points/16 bytes
Valve Output: 32 points / 4 bytes
IO Assignment Direction: Mode 1

ON/OFF COUNT Function: Enable

Remote Configuration
Input Data: [Unit 1] Analog Input Unit (EX600-AXA): 4 bytes
[Unit 2] Digital Input Unit (EX600-DX#D):2 bytes
ON/OFF COUNT/Logger:2 bytes
Output Data: [Unit 0] Digital Output Unit (EX600-DY#B):1 byte
[Unit 3] Remote (EXW1-RMV#) Valve Output:4 bytes

・Slot

Slot1	Slot2	Slot3	Slot5	Slot6	remote EXW1-RMV#	Slot4
DY	AX	DX	ON/OFF Count Logger			valve output

・I/O Map

	Input Data	
	Unit Name	Module Name
Byte0	EXW1-RMV# Remote	**Unit 1** AXA
Byte1		
Byte2		
Byte3		
Byte4		**Unit 2** DX#D
Byte5		
Byte6		**ON/OFF COUNT Logger**
Byte7		
Byte8		Reserved
Byte9		
Byte10		
Byte11		
Byte12		
Byte13		
Byte14		
Byte15		
Total	Used: 8 bytes Free: 8 bytes	

	Output Data	
	Unit Name	Module Name
Byte0	EXW1-RMV# Remote	**Unit 0** DY#B
Byte1		**Unit 3** EXW1-RMV# 32 valve outputs
Byte2		
Byte3		
Byte4		
Byte5		Reserved
Byte6		
Byte7		
Byte8		
Byte9		
Byte10		
Byte11		
Byte12		
Byte13		
Byte14		
Byte15		
Total	Used: 5 bytes Free: 11 bytes	

・ON/OFF COUNT/Logger Input Map

	Bit 7							Bit 0
Byte N	Notification ch8	Notification ch8	Notification ch6	Notification ch5	Notification ch4	Notification ch3	Notification ch2	Notification ch1
Byte N+1	Notification ch16	Notification ch15	Notification ch14	Notification ch13	Notification ch12	Notification ch11	Notification ch10	Notification ch9

<Example 1>

・For Mode 2

	Unit 3	Unit 2	Unit 1	Unit 0	
	DY□B	AXA	DX□D	EXW1-RMV#	
End Plate	Digital Output 1 byte Output	Analog Input 4 bytes Input	Digital Input 2 bytes Input	Remote 4 bytes Output	Valve Manifold (32 points)

●Remote configuration parameter values
Input size: 128 points/16 bytes
Output size: 128 points / 16 bytes
Valve Output: 32 points / 4 bytes
IO Assignment Direction: Mode 2

ON/OFF COUNT Function: Enable

Remote Configuration
Input Data: [Unit 1] Digital Input Unit (EX600-DX#D):2 bytes
[Unit 2] Analog Input Unit (EX600-AXA):4 bytes
ON/OFF COUNT/Logger:2 bytes
Output Data: [Unit 0] Remote (EXW1-RMV#) Valve Output:4 bytes
[Unit 3] Digital Output Unit (EX600-DY#B):1 byte

・Slot

Slot6	Slot5	Slot4	Slot3	Slot2	remote EXW1-RMV#	Slot1
ON/OFF Count Logger		DY	AX	DX		valve output

・I/O Map

	Input data	
	Unit Name	Module Name
Byte0	EXW1-RMV# Remote	**Unit 1** DX#D
Byte1		
Byte2		**Unit 2** AXA
Byte3		
Byte4		
Byte5		
Byte6		**ON/OFF COUNT Logger**
Byte7		
Byte8		Reserved
Byte9		
Byte10		
Byte11		
Byte12		
Byte13		
Byte14		
Byte15		
Total	Used: 8 bytes Free: 8 bytes	

	Output Data	
	Unit Name	Module Name
Byte0	EXW1-RMV# Remote	**Unit 0** EXW1-RMV# 32 valve outputs
Byte 1		
Byte2		
Byte3		
Byte4		**Unit 3** DY#B
Byte5		Reserved
Byte6		
Byte7		
Byte8		
Byte9		
Byte10		
Byte11		
Byte12		
Byte13		
Byte14		
Byte15		
Total	Used: 5 bytes Free: 11 bytes	

・ON/OFF COUNT/Logger Input Map

	Bit 7							Bit 0
Byte N	Notification ch8	Notification ch8	Notification ch6	Notification ch5	Notification ch4	Notification ch3	Notification ch2	Notification ch1
Byte N+1	Notification ch16	Notification ch15	Notification ch14	Notification ch13	Notification ch12	Notification ch11	Notification ch10	Notification ch9

<Example 2>

・For Mode 1

	Unit 0	Unit 1	
End Plate	LAB1 IO-Link Master 70 bytes Input 66 bytes Output	EXW1-RMV# Remote 4 bytes Output	Valve Manifold (32 points)

●Remote configuration parameter values
Input size: 640 points/80 bytes
Output size: 640 points/80 bytes
Valve output: 32 points/4 bytes)
I/O Assignment Direction: Mode 1

IO-Link Master Unit (EX600-LAB1)
P1/P2/P3/P4 Port INPUT IO-Link Size: 16 bytes
Port Output IO-Link Size: 16 bytes
Port Mode: IOL AutoStart
SIO Input: 2 bytes, Output: 2 bytes
PQI Input: 4 bytes, Output: 0 bytes
ON/OFF COUNT Function: Disabled

Remote Configuration
Input Data: [Unit 0] IO-Link Master Unit (EX600-LAB1):70 bytes
Output Data: [Unit 0] IO-Link Master Unit (EX600-LAB1):66 bytes
[Unit 1] Remote (EXW1-RMV#) Valve Output:4 bytes

・Slot

Slot1	Slot2	Slot3	Slot4	Slot5	Slot6	remote EXW1-RMV#	Slot7
IO-Link Master EX600-LA#							valve output

・Input Map

	Input Data											
	Unit Name	Module Name			Bit 7	6	5	4	3	2	1	Bit 0
Byte0	EXW1-RMV# Remote	**Unit 0** E600 LA#	SIO		X2	X4	X2	X4	X2	X4	X2	X4
					Port 4		Port 3		Port 2		Port 1	
Byte 1					Reserved (fixed value: 0)							
Byte 2 ・ ・ ・ Byte 17			P1 (Port 1)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link size setting							
Byte 18 ・ ・ ・ Byte 33			P2 (Port 2)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link Size setting							
Byte 34 ・ ・ ・ Byte 49			P3 (Port 3)		Input Process Data Port: The occupied size varies based on the INPUT IO-Link Size setting							
Byte 50 ・ ・ ・ Byte 65			P4 (Port 4)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link Size setting							
Byte 66			PQI	Port 1 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte67				Port 2 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte68				Port 3 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte69				Port 4 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ-Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte 70 ~ Byte79		Not connected			Reserved							
		Not connected			Reserved							
		Not connected			Reserved							
		Not connected			Reserved							
Total	Used: 70 bytes Free: 10 bytes											

・Output Map

	Output Data											
	Unit Name	Module Name		Bit 7	6	5	4	3	2	1	Bit 0
Byte0	EXW1-RMV# Remote	**Unit 0** E600 LA#	SIO	-	Y4	-	Y4	-	Y4	-	Y4
				Port 4		Port 3		Port 2		Port 1	
Byte 1				Reserved (fixed value: 0)							
Byte 2 ・ ・ ・ Byte 17			P1 (Port 1)	Output Process Data Port Output: The size occupied varies based on the IO-Link Size setting							
Byte 18 ・ ・ ・ Byte 33			P2 (Port 2)	Output Process Data Port Output: The size occupied varies based on the IO-Link Size setting							
Byte 34 ・ ・ ・ Byte 49			P3 (Port 3)	Output Process Data Port Output: The size occupied varies based on the IO-Link Size setting							
Byte 50 ・ ・ ・ Byte 65			P4 (Port 4)	Output Process Data Port Output: The occupied size varies based on the IO-Link Size setting							
Byte 66		**Unit 1** EXW1-RMV# 32 valve outputs		7							0
Byte 67				15							8
Byte68				23							16
Byte69				31							24
Byte70		Not connected		Reserved							
Byte71		Not connected		Reserved							
Byte72		Not connected		Reserved							
Byte73		Not connected		Reserved							
Byte74		Not connected		Reserved							
Byte75		Not connected		Reserved							
Byte76		Not connected		Reserved							
Byte77		Not connected		Reserved							
Byte78		Not connected		Reserved							
Byte79		Not connected		Reserved							
Total	Used: 70 bytes Free: 10 bytes										

<Example 2>

・For Mode 2

	Unit 1	Unit 0	
End Plate	LAB1 IO-Link Master 70 bytes Input 66 bytes Output	EXW1-RMV# Remote 4 bytes Output	Valve Manifold (32 points)

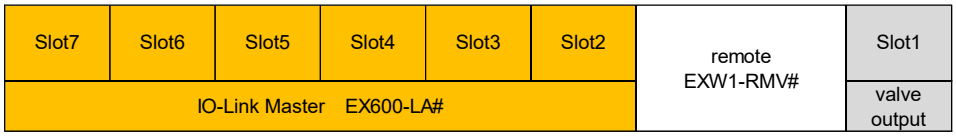
●Remote configuration parameter values
Input size: 640 points / 80 bytes
Output size: 640 points/80 bytes
Valve output: 32 points/4 bytes)
I/O Assignment Direction: Mode 2

IO-Link Master Unit (EX600-LAB1)
P1/P2/P3/P4 Port INPUT IO-Link Size: 16 bytes
Port Output IO-Link Size: 16 bytes
Port Mode: IOL AutoStart
SIO Input: 2 bytes, Output: 2 bytes
PQI Input: 4 bytes, Output: 0 bytes

ON/OFF COUNT Function: Disabled

Remote Configuration
Input Data: [Unit 1] IO-Link Master Unit (EX600-LAB1):70 bytes
Output data: [Unit 0] Remote (EXW1-RMV#) Valve output:4 bytes
[Unit 1] IO-Link Master Unit (EX600-LAB1):66 bytes

・Slot



・Input Map

	Input Data											
	Unit Name	Module Name			Bit 7	6	5	4	3	2	1	Bit 0
Byte0	EXW1 RMV# Remote	E600 LA# (Unit 0)	SIO		X2	X4	X2	X4	X2	X4	X2	X4
					Port 4		Port 3		Port 2		Port 1	
Byte 1					Reserved (fixed value: 0)							
Byte 2 ・ ・ ・ Byte 17			P1 (Port 1)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link Size setting							
Byte 18 ・ ・ ・ Byte 33			P2 (Port 2)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link Size setting							
Byte 34 ・ ・ ・ Byte 49			P3 (Port 3)		Input Process Data Port: The occupied size varies based on the INPUT IO-Link Size setting							
Byte 50 ・ ・ ・ Byte 65			P4 (Port 4)		Input Process Data Port INPUT: The size occupied varies based on the IO-Link Size setting							
Byte 66			PQI	Port 1 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte 67				Port 2 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ-Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte68				Port 3 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ-Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte69				Port 4 Status (PQI)	PQ	Dev-Err	Dev-Com	DS Status	CQ-Short	Pwr-Short	Pdmapping Mismatch	ID Mismatch
Byte 70		Not connected			Reserved							
≀		Not connected			Reserved							
		Not connected			Reserved							
Byte79		Not connected			Reserved							
Total	Used: 70 bytes Free: 10 bytes											

・Output Map

<table>
<tr><td rowspan="2"></td><td colspan="10">Output Data</td></tr>
<tr><td>Unit Name</td><td colspan="2">Module Name</td><td>Bit 7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>Bit 0</td></tr>
<tr><td>Byte0</td><td rowspan="30">EXW1 RMV# Remote</td><td colspan="2" rowspan="4">Unit 0
EXW1-RMV#
32 valve outputs</td><td colspan="8">7 ... 0</td></tr>
<tr><td>Byte1</td><td colspan="8">15 ... 8</td></tr>
<tr><td>Byte2</td><td colspan="8">23 ... 16</td></tr>
<tr><td>Byte3</td><td colspan="8">31 ... 24</td></tr>
<tr><td>Byte4</td><td rowspan="5">Unit 1
E600
LA#</td><td rowspan="2">SIO</td><td>-</td><td>Y4</td><td>-</td><td>Y4</td><td>-</td><td>Y4</td><td>-</td><td>Y4</td></tr>
<tr><td>Byte 5</td><td colspan="2">Port 4</td><td colspan="2">Port 3</td><td colspan="2">Port 2</td><td colspan="2">Port 1</td></tr>
<tr><td>Byte 6
・
・
・
Byte 21</td><td>P1 (Port 1)</td><td colspan="8">Reserved (fixed value: 0)
Output Process Data
Port Output: The size occupied varies based on the IO-Link Size setting</td></tr>
<tr><td>Byte 22
・
・
・
Byte 37</td><td>P2 (Port 2)</td><td colspan="8">Output Process Data
Port Output: The occupied size varies based on the IO-Link Size setting</td></tr>
<tr><td>Byte 38
・
・
・
Byte 53</td><td>P3 (Port 3)</td><td colspan="8">Output Process Data
Port Output: The size occupied varies based on the IO-Link Size setting</td></tr>
<tr><td>Byte 54
・
・
・
Byte 69</td><td>P4 (Port 4)</td><td colspan="8">Output Process Data
Port Output: The occupied size varies based on the IO-Link Size setting</td></tr>
<tr><td>Byte70</td><td colspan="2"></td><td colspan="8"></td></tr>
<tr><td>Byte71</td><td colspan="2"></td><td colspan="8"></td></tr>
<tr><td>Byte72</td><td colspan="2"></td><td colspan="8"></td></tr>
<tr><td>Byte73</td><td colspan="2"></td><td colspan="8"></td></tr>
<tr><td>Byte74</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Byte75</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Byte76</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Byte77</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Byte78</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Byte79</td><td colspan="2">Not connected</td><td colspan="8">Reserved</td></tr>
<tr><td>Total</td><td colspan="11">Used: 70 bytes Free: 10 bytes</td></tr>
</table>

Diagnostics

Diagnostic Allocation

Based on the diagnostic allocation settings, the following diagnostic data is allocated at the beginning of the input data in the IO map.
If the diagnostic allocation is configured in detail, the diagnostic size varies depending on the number of remotely registered units.

Diagnostic Allocation	Diagnostic Data		Diagnostic Size
None	No diagnostic data		0 bytes
Basic	System Diagnostics		4 bytes
Detailed	System Diagnostics + Remote Connection/Diagnostics /Registration Information	Number of remotely registered units: 0	4 bytes
		Number of remotely registered units: 15	10 bytes
		Number of remotely registered units: 31	16 bytes
		Number of remotely registered units: 63	28 bytes
		Number of remotely registered units: 127	52 bytes

Diagnostic Data Details

If a remote error occurs, a flag is set in the bit corresponding to the respective diagnostic information.
Note that since System Diagnostics 1–4 display errors for the entire system, if a fault occurs in even a single unit within the system, a flag is set in the bit corresponding to that fault.
You can identify the remote system experiencing the issue using the remote diagnostic information.
(You must have configured the diagnostic assignment in detail in the base system settings.)
Additionally, regardless of the diagnostic assignment settings, you can identify the modules and units experiencing faults by using the IO Configurator provided by our company.

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
System Diagnosis 1	0	0	User setting lower level detection	Detected that the analog setting has exceeded the lower limit of the user set value.	Unit	Continue	Automatic reset	Select an appropriate range so that they are within the user set value range. Or disable the diagnostics.	MS: Red flashing
		1	User setting upper limit detection	Detected that the analog setting has exceeded the upper limit of the user set value.	Unit	Continue	Automatic reset	Select an appropriate range so that they are within the user set value range. Or disable the diagnostics.	
		2	Detection of the range lower limit	Detected that the analog setting has exceeded the lower limit of the setting range.	Unit	Continue	Automatic reset	Select an appropriate range so that the input value is within the set range.	
		3	Detection of the range upper limit	Detected that the analog setting has exceeded the upper limit of the setting range.	Unit	Continue	Automatic reset	Select an appropriate range so that the input value is within the set range.	
		4	Detection of upper limit of ON/OFF operation cycle	The number of ON/OFF operating cycles has exceeded the upper limit of the setting value.	Unit	Continue	Automatic reset	Reset the ON/OFF cycles to zero. Or disable the diagnostics.	
		5	Detection of unconnected load	Detects the broken wire.	Unit	Continue	Manual/ automatic reset	(1) Replace the valve or the input/output equipment, and check the operation. (2) Replace the valve or the output equipment, and check the operation.	

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
System Diagnosis 1	0	6	Short-circuit detection of output load	A short-circuit of the valve or the output equipment has been detected.	Unit	Continue	Manual/ automatic reset	(1) Replace the valve or the output equipment, and check the operation. (2) Replace the valve or the output equipment, and check the operation.	MS: Red flashing
		7	Short-circuit detection of power supply for Control and Input	A short-circuit of the input equipment power supply has been detected.	Unit	Continue	Automatic reset	Check the part which has been causing the error and review the wiring or check if the input equipment is normal.	

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
System diagnosis 2	1	0	Detection of a reduction in the US2 (for output) power voltage	A voltage drop of the US2 (for output) power supply voltage has been detected.	Unit	Continue	Automatic reset	Supply 24 VDC +/-10% for the US2 (for output) power supply voltage.	PWR (V): Green flashing or Red flashing
		1	Detection of a reduction in the US1 (for Control and Input) power voltage	A voltage drop of the US1 (for Control and Input) power supply voltage has been detected.	Unit	Continue	Automatic reset	Base : Supply 11 to 25VDC for V+(US1) power source. Remote : Supply 24 VDC +/-10% for the US1 (for Control and Input) power supply voltage.	MS: Green flashing
		2	Reserved	-	-	-	-	-	-
		3	Connection failure between units (during operation)	An error has occurred in the communication between the wireless unit and EX600 I/O units.	Unit	Stop (HOLD)	Turn the power on again.	Confirm that there is no loose connection between the EX600 I/O units, and connect them correctly.	MS: Red flashing
		4	Connection failure between units (when power is supplied)	An error has occurred in the communication between the wireless unit and EX600 I/O units.	Unit	Stop (HOLD)	Turn the power on again.	Confirm that there is no loose connection between the EX600 I/O units, and connect them correctly.	MS: Red flashing
		5	Configuration Memory Error	There is a discrepancy with the configuration saved during pairing.	Unit	Stop (HOLD)	Turn the power on again.	Please verify the configuration saved during pairing and correct it. Alternatively, perform pairing again and re-register the configuration.	ST(M):Red on
		6	Detection of system error (when power is supplied)	An unrecoverable error has occurred in the system.	Unit	Stop (HOLD)	Manual reset	Supply power again. If the error persists after resupplying power, contact your SMC sales representative.	MS: Red on
		7	Detection of hardware error (during operation)	An unrecoverable error has occurred in the hardware.	Unit	Stop (HOLD)	Manual reset	Supply power again. If the error is not restored after resupplying power, contact your SMC sales representative.	MS: Red on

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
System diagnosis 3	2	0	Number of inputs/outputs setting error	The number of occupied inputs/outputs of the Remote has exceeded the set value.	System	Continue	Manual reset	Change the user set value. Or, adjust the unit configuration so that the number of occupied points is within the set value.	MS: Red flashing
		1	Abnormal number of connected units	The number of connected IO modules exceeds the maximum allowable limit.	unit	Continue	Turn the power on again.	Adjust the unit configuration to ensure it remains within the allowable number of connected units	MS: Red flashing
		2	IO-Link unit connection error	The number of connected IO-Link master units exceeds the upper limit.	unit	Continue	Turn the power on again.	Adjust the unit configuration to ensure it remains within the allowable number of connected units	MS: Red flashing
		3	Wireless adaptor internal connection error	Internal communication with the wireless adaptor is not performed normally.	System	Stop (Hold)	Automatic reset	Check for loose connectors and broken wires.	MS: Red flashing or MS: orange flashing
		4	Reserved	-	-	-	-	-	-
		5	Reserved	-	-	-	-	-	-
		6	System Error detected	Memory read/write error	System	Continue	Manual reset	Initialize the product. If the error persists after resupplying power, contact your SMC sales representative.	MS: Red flashing
		7	Detection of hardware error	Memory write error	System	Continue	Manual reset	Initialize the product. If the error persists after resupplying power, contact your SMC sales representative.	MS: Red flashing

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
System diagnosis 4	3	0	Number of system inputs/outputs setting error	The number of occupied system inputs/outputs has exceeded the set value.	System	Stop (Hold)	Manual reset	Change the user set value. Or, adjust the unit configuration so that the number of occupied points is within the set value.	Base MS: Red flashing
		1	Number of registered Remotes setting error (Outside of the wireless channel setting range)	More wireless channels than specified in the number of registered Remotes setting are registered.	System	Continue	Manual reset	Change the set value of the number of registered Remotes. Or, delete the registered Remotes (wireless channels) outside of the set range.	Base MS: Red flashing
		2	Enforce mode	Active the enforce mode	System	Continue	Manual reset	Exit from enforce mode.	Base, Remote W-NS: orange on
		3	Reserved	-	-	-	-	-	-
		4	Reserved	-	-	-	-	-	-
		5	Reserved	-	-	-	-	-	-
		6	Wireless registration data corrupted	An error has occurred in the wireless registration information.	System	Stop (HOLD)	Manual reset	Supply power again. If the error persists after resupplying power, contact your SMC sales representative.	Base MS: Red on or W-NS: red on
		7	Detection of wireless hardware error	An unrecoverable error has occurred in the hardware of the wireless units.	System	Stop (HOLD)	Manual reset	Supply power again. If the error persists after resupplying power, contact your SMC sales representative.	Base MS: Red on or W-NS: red on

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
Remote connection information Wireless channels 1-7 (Bit 0 is fixed at "0".)	4	0	-		-	-	-	-	When the connection data is "0", the wireless communication with the Remote is not connected.
		1	Connection condition of the Remote communication (Wireless channel 1)		-	-	-	-	
		2	Connection condition of the Remote communication (Wireless channel 2)		-	-	-	-	
		3	Connection condition of the Remote communication (Wireless channel 3)		-	-	-	-	
		4	Connection condition of the Remote communication (Wireless channel 4)		-	-	-	-	
		5	Connection condition of the Remote communication (Wireless channel 5)		-	-	-	-	
		6	Connection condition of the Remote communication (Wireless channel 6)		-	-	-	-	
		7	Connection condition of the Remote communication (Wireless channel 7)		-	-	-	-	
Remote connection information Wireless channels 8-15	5	0	Connection condition of the Remote communication (Wireless channel 8)		-	-	-	-	When the connection data is "1", the wireless communication with the Remote is connected normally.
		1	Connection condition of the Remote communication (Wireless channel 9)		-	-	-	-	
		2	Connection condition of the Remote communication (Wireless channel 10)		-	-	-	-	
		3	Connection condition of the Remote communication (Wireless channel 11)		-	-	-	-	
		4	Connection condition of the Remote communication (Wireless channel 12)		-	-	-	-	
		5	Connection condition of the Remote communication (Wireless channel 13)		-	-	-	-	
		6	Connection condition of the Remote communication (Wireless channel 14)		-	-	-	-	
		7	Connection condition of the Remote communication (Wireless channel 15)		-	-	-	-	

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
Remote diagnostic information Wireless channels 1-7 (Bit 0 is for Base)	6	0	Presence / absence of system information error of Base		-	-	-	-	No error in the Base / Remote when the diagnostic data is "0". Error in the Base / Remote when the diagnostic data is "1".
		1	Presence / absence of system information error of Remote (Wireless channel 1)		-	-	-	-	
		2	Presence / absence of system information error of Remote (Wireless channel 2)		-	-	-	-	
		3	Presence / absence of system information error of Remote (Wireless channel 3)		-	-	-	-	
		4	Presence / absence of system information error of Remote (Wireless channel 4)		-	-	-	-	
		5	Presence / absence of system information error of Remote (Wireless channel 5)		-	-	-	-	
		6	Presence / absence of system information error of Remote (Wireless channel 6)		-	-	-	-	
		7	Presence / absence of system information error of Remote (Wireless channel 7)		-	-	-	-	
Remote diagnostic information Wireless channels 8-15	7	0	Presence / absence of system information error of Remote (Wireless channel 8)		-	-	-	-	
		1	Presence / absence of system information error of Remote (Wireless channel 9)		-	-	-	-	
		2	Presence / absence of system information error of Remote (Wireless channel 10)		-	-	-	-	
		3	Presence / absence of system information error of Remote (Wireless channel 11)		-	-	-	-	
		4	Presence / absence of system information error of Remote (Wireless channel 12)		-	-	-	-	
		5	Presence / absence of system information error of Remote (Wireless channel 13)		-	-	-	-	
		6	Presence / absence of system information error of Remote (Wireless channel 14)		-	-	-	-	
		7	Presence / absence of system information error of Remote (Wireless channel 15)		-	-	-	-	

Item	Byte	Bit No.	Content of diagnostics		Diagnosed area and processing upon error		How to reset	Reset conditions	Remarks (LED indications, etc.)
			Item	Details	Effective diagnostic coverage	I/O processing upon diagnosis			
Remote registration information Wireless channels 1-7 (Bit 0 is fixed at "0".)	8	0	-		-	-	-	-	When the registration data is "0", no Remote has been registered.
		1	Registration of Remote (Wireless channel 1)		-	-	-	-	
		2	Registration of Remote (Wireless channel 2)		-	-	-	-	
		3	Registration of Remote (Wireless channel 3)		-	-	-	-	
		4	Registration of Remote (Wireless channel 4)		-	-	-	-	
		5	Registration of Remote (Wireless channel 5)		-	-	-	-	
		6	Registration of Remote (Wireless channel 6)		-	-	-	-	
		7	Registration of Remote (Wireless channel 7)		-	-	-	-	
Remote registration information Wireless channels 8-15	9	0	Registration of Remote (Wireless channel 8)		-	-	-	-	When the registration data is "1", a Remote has been registered.
		1	Registration of Remote (Wireless channel 9)		-	-	-	-	
		2	Registration of Remote (Wireless channel 10)		-	-	-	-	
		3	Registration of Remote (Wireless channel 11)		-	-	-	-	
		4	Registration of Remote (Wireless channel 12)		-	-	-	-	
		5	Registration of Remote (Wireless channel 13)		-	-	-	-	
		6	Registration of Remote (Wireless channel 14)		-	-	-	-	
		7	Registration of Remote (Wireless channel 15)		-	-	-	-	

*1: The LED indicator W-MS indicates the system status of the Remote.
If it is ON or flashes, errors have occurred in the registered Remote.

*: When the diagnostic data of the system diagnostics 1-4 is "0", no error has occurred. When it is "1", errors have occurred.

*: This table is for when the number of registered Remotes is set to 15 in the Base settings.
The diagnostic sizes of Remote connection information, diagnostic information and registration information vary depending on the setting for the number of registered wireless units.

*: The bit0 of connection/registration information is fixed at "0".

*: The bit0 of diagnostic information indicates the diagnostic information of the Base.

Events (Error Information)



・Event tab display

No.	Display	Content
(1)	Select Model	Select a remote registered to the wireless base.
(2)	Clear Event Data	Delete saved event data
(3)	Extract Event Data	You can export event data to a text file.
(4)	Timestamp	Displays the time at which the event was recorded. Only for Wireless Protocol V.2.0, the time synchronized with the server is displayed. * If time synchronization is not enabled, the elapsed time since the device was powered on is displayed. **< EXW1-BMJA# >** * Time synchronization must be enabled in the System Settings section of the Settings tab. **< EXW1-BECAC >** * Time synchronization must be performed using the EtherCAT Distributed Clocks feature. **< EXW1-BENAC1 / EXW1-BPNAC1 / EXW1-BMTAC >** * Time synchronization must be performed using the OPC UA Discovery Server or via the System Settings in the Settings tab.
(5)	Unit	Displays the unit number.
(6)	Channel	Displays the wireless remote's channel number.
(7)	Error Code	Displays the error code.

● Error Code

The details and diagnostic map for each error code are shown below.

Error Code	Description	Diagnostic Map		
		Item	Bit No.	
			EXW1-BMJ	Other than EXW1-BMJ
1	US1 or US2 Short-Circuit Detection	System Diagnostics 1	6 or 7	
2	Lower Range Limit Detection		2	
3	Upper Range Detection		3	
6	No-Load Detection		5	
7	User-Set Upper Limit Detection		1	
8	User-Set Lower Limit Detection		0	
9	ON/OFF Count Limit Detection		4	
16	US1 Power Supply Voltage Drop Detection	System Diagnostics 2	9	1
17	US2 Power Supply Voltage Drop Detection		8	0
19	Connection Fault Between Units (During Operation)		11	3
20	Connection error between units (at power-on)		12	4
22	System Anomaly Detection (at Power-On)		14	6
23	Hardware Fault Detection (During Operation)		15	7
64	IO Point Configuration Error	System Diagnostics 3	0	
65	Abnormal number of connected units		1	
66	IO-Link unit connection error		2	
67	Internal communication error between wireless adapters		3	
70	System Anomaly Detection		6	
71	Hardware Fault Detection		7	
72	System I/O Point Configuration Error	System Diagnostics 4	8	0
73	Remote Registration Count Setting Error(Out of wireless channel setting range)		9	1
76	Network Configuration Error		12	-
78	Wireless Registration Data Corruption		14	6
79	Wireless Hardware Fault Detection		15	7
80	IO-Link Device Error Detection	Not reflected in the diagnostic map		
81	IO-Link Device Warning Detection			
82	IO-Link Master Error Detection			
83	IO-Link Master Warning Detection			
84	Configuration Assembly Error			

*For details on the diagnostic map, refer to the “Diagnostic Map Details” section in the user manual for your wireless base.

ON/OFF Time Measurement Function

This function enables the measurement of ON/OFF time between two input points, as well as between an input point and an output point.
Up to 16 timers (Timer Ch 0 to Timer Ch 15) can be used to measure ON/OFF time.
For each timer, you can configure the two channels to be measured (either two input channels or an input/output channel), as well as the triggers for measurement start and end (rising edge, falling edge, or both edges).

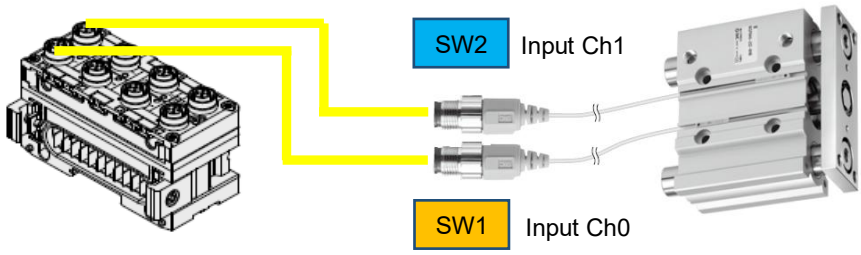
This feature is enabled only when using wireless protocol V.2.0.

The latest value, average value, maximum value, and minimum value of the ON/OFF time can be checked using the IO Configurator or upper-level communication commands.
Please refer to the details below.

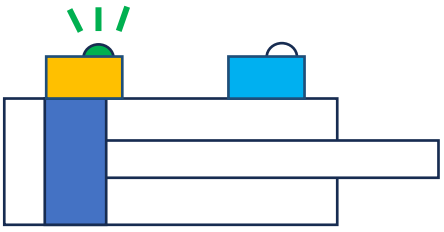
- Configuration via the IO Configurator (page56)

Illustration of the ON/OFF Time Measurement Function

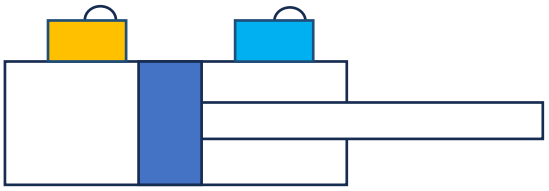
Please refer to the following pages for detailed configuration information.



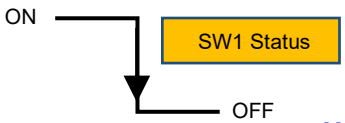
1. SW1: ON, SW2: OFF (state before measurement begins)



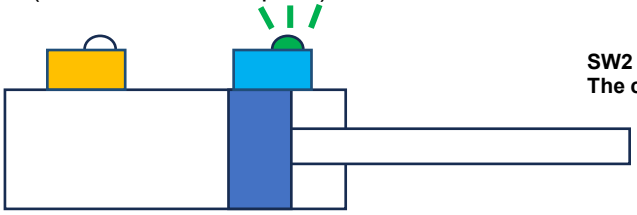
2. SW1: Changes from ON to OFF; SW2: OFF (Measurement begins)



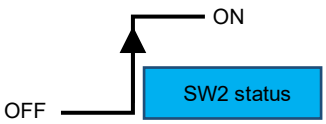
SW1 changes from the ON state to the OFF state.
The change is detected by the edge.



3. SW1: OFF state; SW2: Changes from OFF to ON (measurement complete)



SW2 changes from the OFF state to the ON state.
The change is detected by the edge.

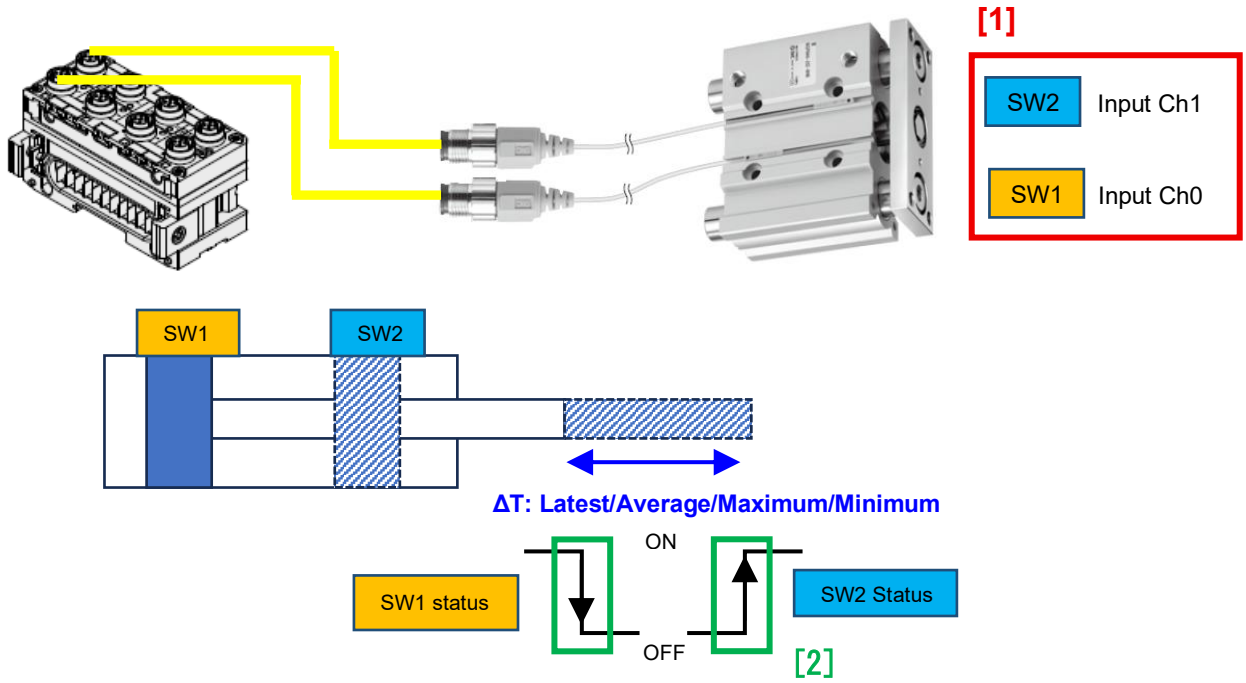


You can measure the time interval ΔT. ΔT: Latest/Average/Maximum/Minimum

Parameter Details and Configuration Examples

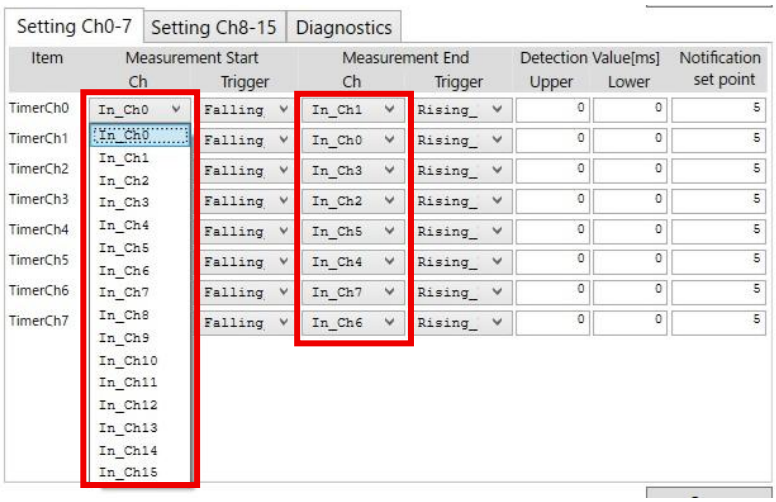
The following describes the setup procedure based on the connection example below.

- Connection Example -
Wireless Remote: EXW-RMV*M5C-*
Configuration Tool: IO Configurator
Application: Install two auto switches (SW1 and SW2) on an air cylinder,
and measure the actuation time of the air cylinders.



[1] Set the two input channels or input/output channels used to measure ON/OFF times

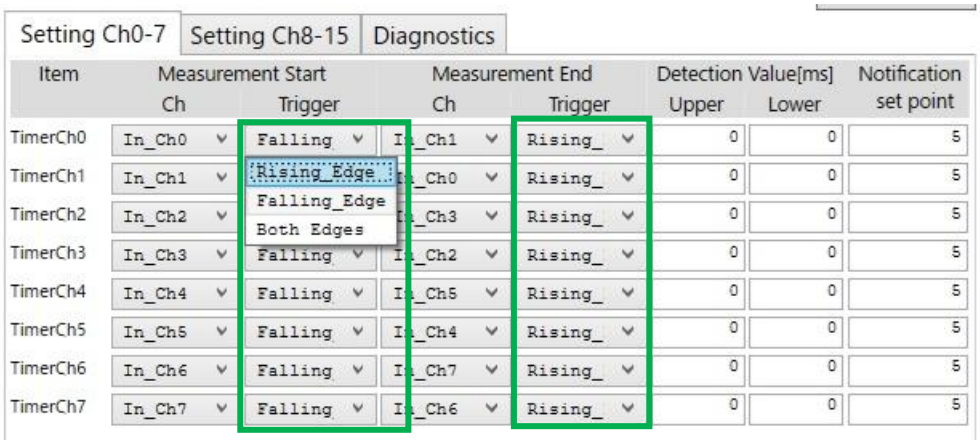
For each timer (Timer Ch 0 through Timer Ch 15), you can configure the two input channels or input/output channels.
[Input Ch 0 and Input Ch 1 for Timer Ch 0], [Input Ch 3 and Input Ch 6 for Timer Ch 1], [Input Ch 4 and Output Ch 0 for Timer Ch 2], etc.; you can assign any input or output channels to each Timer Ch. Additionally, you can set the same input/output channels for multiple timers.



Excerpt from the IO Configurator settings screen (page56)

[2] Set the triggers for starting and ending measurements

For the input channels or input/output channels configured in [1], set the measurement start and stop triggers: rising edge,falling edge, or both edges.



Excerpt from the IO Configurator settings screen(page56)

Correspondence Table for [1] and [2] (when using host communication commands)

The relationship between the input value and the Timer, Measurement Start Channel, Measurement Start Trigger, Measurement End Channel, and Measurement End Trigger is shown in the table below. For Timer Ch0 through Timer Ch15, the [Measurement Start Channel], [Measurement Start Trigger], [Measurement End Channel],[Measurement End Trigger] are set in bulk.

***Measurements cannot be performed if the Measurement Start/End Channels and Measurement Start/End Triggers are the same.**

Example: Measurement Start/End Channel: Ch1, Measurement Start/End Trigger: falling edge, etc.

		[2]	[1]	[2]	[1]
Name	Input Value (Hex)	Measurement End Trigger	Measurement End Channel	Measurement Start Trigger	Measurement Start Channel
Ch 0: Timer Trigger	0x0001	0	0	0	1
	0x0002	0	0	0	2
	:				
	0x0110	0	1	1	0
	:				
	0x2F2D	2	F	2	D
	0x2F2E	2	F	2	E

:

Name	Input Value (Hex)	Measurement End Trigger	Measurement End Channel	Measurement Start Trigger	Measurement Start Channel
Ch 15: Timer Trigger	0x0001	0	0	0	1
	0x0002	0	0	0	2
	:				
	0x0E1F	0	E	1	F
	:				
	0x2F2D	2	F	2	D
	0x2F2E	2	F	2	E

: This is the default value. For details, please refer to the "EXW1-RDX* Default Value Reference Table" and the "EXW1-RDM* Default Value Reference Table" (page225).

Example) For Timer Ch 5, if [Measurement Start Ch: Ch9], [Measurement Start Trigger: Both Edges], [Measurement End Ch: Ch5],
[Measurement End Trigger: Falling Edge], the settings will be as shown in the table below.

Input Value	**0x**	**1**	**5**	**2**	**9**
	Hexadecimal (Hex)	Measurement End Trigger **Falling edge**	Measurement End Ch **Ch5**	Measurement Start Trigger **Both edges**	Measurement Start Ch **Ch9**

The correspondence between hexadecimal notation and the EXW1-RDX* channels and triggers is as follows.

Hexadecimal Notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Supported Ch	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Trigger*1	↑	↓	↑↓	Invalid*2												

*1: ↑ indicates a rising edge, ↓ indicates a falling edge, and ↑↓ indicates both edges.
*2: If the " " trigger is disabled, all input values will be invalid and cannot be configured.

EXW1-RMV* Default Value Correspondence Table(ON/OFF COUNT Mode：Input)

Name	Default Value (Hex)	Measurement End Trigger	Measurement End Channel	Measurement Start Trigger	Measurement Start Channel
Timer Ch 0	0x0110	0 (Rising edge)	1	1 (falling edge)	0
Timer Ch 1	0x0011	0 (Rising Edge)	0	1 (falling edge)	1
Timer Ch 2	0x0312	0 (Rising Edge)	3	1 (falling edge)	2
Timer Ch 3	0x0213	0 (Rising Edge)	2	1 (falling edge)	3
Timer Ch 4	0x0514	0 (Rising Edge)	5	1 (falling edge)	4
Timer Ch 5	0x0415	0 (Rising Edge)	4	1 (falling edge)	5
Timer Ch 6	0x0716	0 (Rising Edge)	7	1 (falling edge)	6
Timer Ch 7	0x0617	0 (Rising Edge)	6	1 (falling edge)	7
Timer Ch 8	0x0918	0 (Rising Edge)	9	1 (falling edge)	8
Timer Ch 9	0x0819	0 (Rising Edge)	8	1 (falling edge)	9
Timer Ch 10	0x0B1A	0 (Rising Edge)	B	1 (falling edge)	A
Timer Ch 11	0x0A1B	0 (Rising Edge)	A	1 (falling edge)	B
Timer Ch 12	0x0D1C	0 (Rising Edge)	D	1 (falling edge)	C
Timer Ch 13	0x0C1D	0 (Rising Edge)	C	1 (falling edge)	D
Timer Ch 14	0x0F1E	0 (Rising Edge)	F	1 (falling edge)	E
Timer Ch 15	0x0E1F	0 (Rising Edge)	E	1 (falling edge)	F

EXW1-RMV* Default Value Correspondence Table(ON/OFF COUNT Mode：Input/output)

Name	Default Value (Hex)	Measurement End Trigger	Measurement End Channel	Measurement Start Trigger	Measurement Start Channel
Timer Ch 0	0x0110	0 (Rising Edge)	1 (Input Ch1)	1 (falling edge)	0 (Input Ch 0)
Timer Ch 1	0x0011	0 (Rising Edge)	0 (Input Ch0)	1 (falling edge)	1 (Input Ch1)
Timer Ch 2	0x0312	0 (Rising edge)	3 (Input Ch 3)	1 (falling edge)	2 (Input Ch 2)
TimerCh 3	0x0213	0 (Rising Edge)	2 (Input Ch2)	1 (falling edge)	3 (Input Ch 3)
TimerCh 4	0x0514	0 (Rising Edge)	5 (Input Ch 5)	1 (falling edge)	4 (Input Ch 4)
TimerCh 5	0x0415	0 (Rising Edge)	4 (Input Ch4)	1 (falling edge)	5 (Input Ch 5)
TimerCh 6	0x0716	0 (Rising Edge)	7 (Input Ch 7)	1 (falling edge)	6 (Input Ch 6)
TimerCh 7	0x0617	0 (Rising Edge)	6 (Input Ch6)	1 (falling edge)	7 (Input Ch 7)
TimerCh 8	0x0008	0 (Rising Edge)	0 (Input Ch 0)	0 (Rising Edge)	8 (Output Ch0)
TimerCh 9	0x0109	0 (Rising Edge)	1 (Input Ch1)	0 (Rising edge)	9 (Output Ch1)
Timer Ch 10	0x020A	0 (Rising Edge)	2 (Input Ch 2)	0 (Rising Edge)	A (Output Ch2)
Timer Ch 11	0x030B	0 (Rising Edge)	3 (Input Ch 3)	0 (Rising Edge)	B (Output Ch3)
TimerCh 12	0x040C	0 (Rising Edge)	4 (Input Ch 4)	0 (Rising Edge)	C (OutputCh4)
Timer Ch 13	0x050D	0 (Rising Edge)	5 (Input Ch 5)	0 (Rising Edge)	D (OutputCh5)
Timer Ch 14	0x060E	0 (Rising Edge)	6 (Input Ch6)	0 (Rising edge)	E (Output Ch6)
Timer Ch 15	0x060F	0 (Rising Edge)	7 (Input Ch 7)	0 (Rising Edge)	F (Output Ch7)

*: The default value for the measurement start channel for Timer Ch 8 through Timer Ch 15 is the output channel (this can be changed via settings).

The hexadecimal notation and output channels are as follows.

Hexadecimal Notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Supported Ch	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
Type	Input								Output							

Logging and Notification Functions

You can set thresholds for ON/OFF times (see ON/OFF Time Measurement Function) and **log data that falls outside the threshold range**.
You can view up to 40 logs at once, starting with the most recent value. You can save and view up to 5 logs per Timer Channel. Additionally, you can set the number of measurements allowed outside the threshold range and receive a notification if that limit is exceeded.
The log contains the following data, which can be viewed using the IO Configurator or host communication commands.

- Timer Channel No.
- Latest value (value at the time the log entry was created)
- Number of measurements outside the threshold range
- Total number of measurements
  (combined count of measurements within and outside the threshold range)
- Timestamp
  *The latest value, the number of measurements outside the threshold range, and the total number of measurements can be retrieved using higher-level communication commands.
  For details, please refer to the “Acquired Data” (page231).

The logging and notification functions are enabled **when using Wireless Protocol V.2.0 and** under the following conditions.

<Logging Function>
- The upper or lower threshold must be set to a value other than “0” (disabled)

<Notification Function>
- The logging function is enabled, and the specified number of notifications for measurements outside the threshold range is set to a value other than “0 (disabled)”.

The table below shows the corresponding functions for the above conditions.

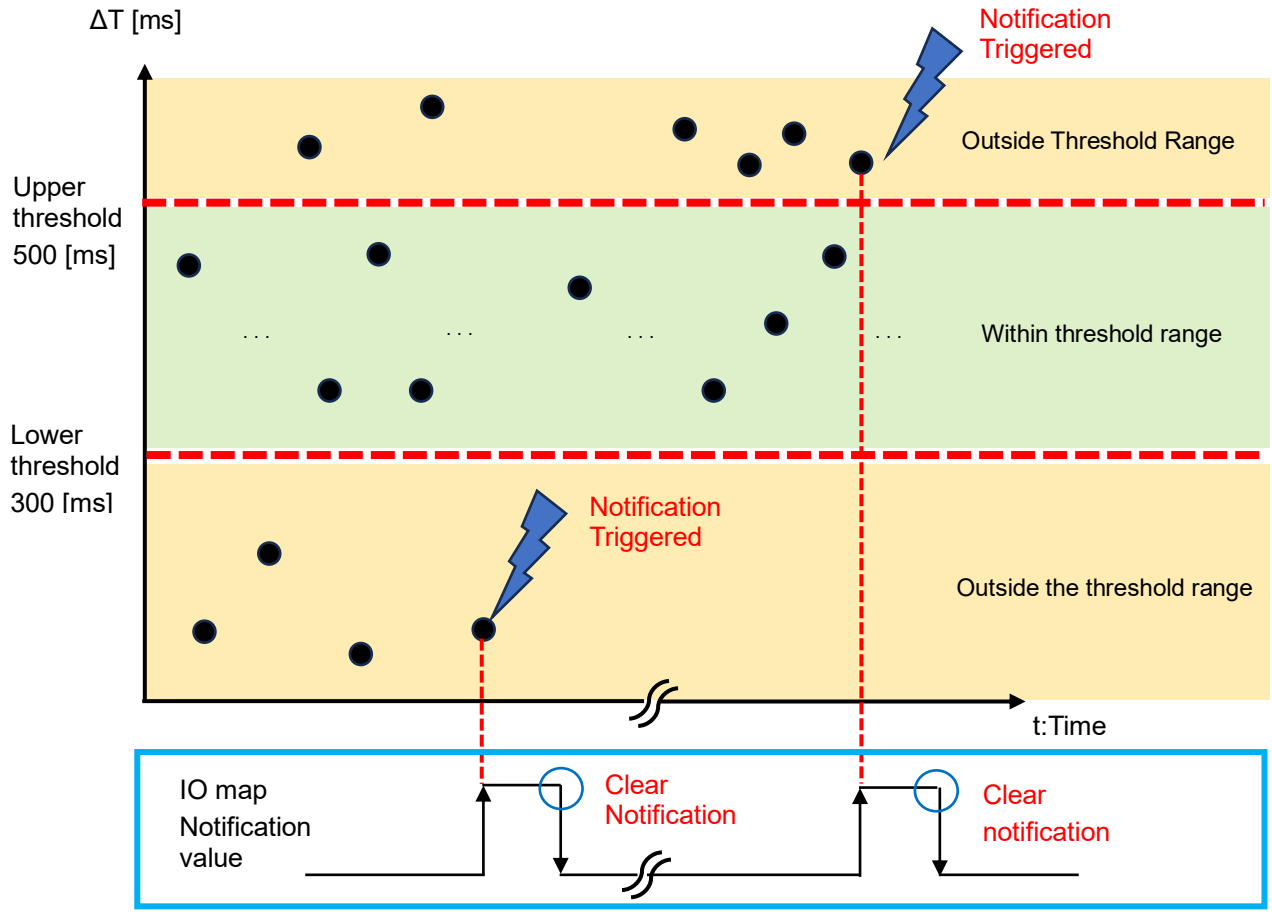
No.	ON/OFF Time Measurement Parameters			Enable functions
	Upper Threshold Setting	Setting the lower threshold	Number of notifications Specified number of notifications	
1	-	-	-	None
2*1	○	-	-	Logging feature
3*2	-	○	-	Logging Function
4	-	-	○	None
5*3	○	○	-	Logging feature
6*4	○	-	○	Logging and notification features
7*5	-	○	○	Logging and notification features
8*6	○	○	○	Logging and notification functions

○: Any value other than “0 (setting disabled)”; -: “0 (setting disabled)”
*1: A log is recorded when the value exceeds the upper threshold setting.
*2: A log will be recorded when the value falls below the configured lower threshold limit.
*3: A log is recorded when the value falls outside the range defined by the upper and lower threshold settings.
*4: A log is recorded when the value exceeds the upper threshold setting, and a notification is generated when the number of occurrences exceeds the specified limit.
*5: A log is recorded when the value falls below the lower threshold setting, and a notification is issued when it exceeds the specified number of occurrences.
*6: A log is recorded when the value falls outside the range defined by the upper and lower threshold settings, and a notification is issued when the number of occurrences exceeds the specified limit.

Please note that logs, the total number of measurements (the combined total of measurements within and outside the threshold range), and the number of measurements outside the threshold range are saved to the memory device at 60-minute intervals starting from power-on. However, **please be aware that logs will not be saved if the time between the last save and power-off is less than 60 minutes.**

Illustration of the Logging and Notification Functions

Please refer to the following pages for detailed settings.



Points that fall outside the threshold range are saved to the log.

LoggingViewer

Channel: All

Clear | Reload | Export

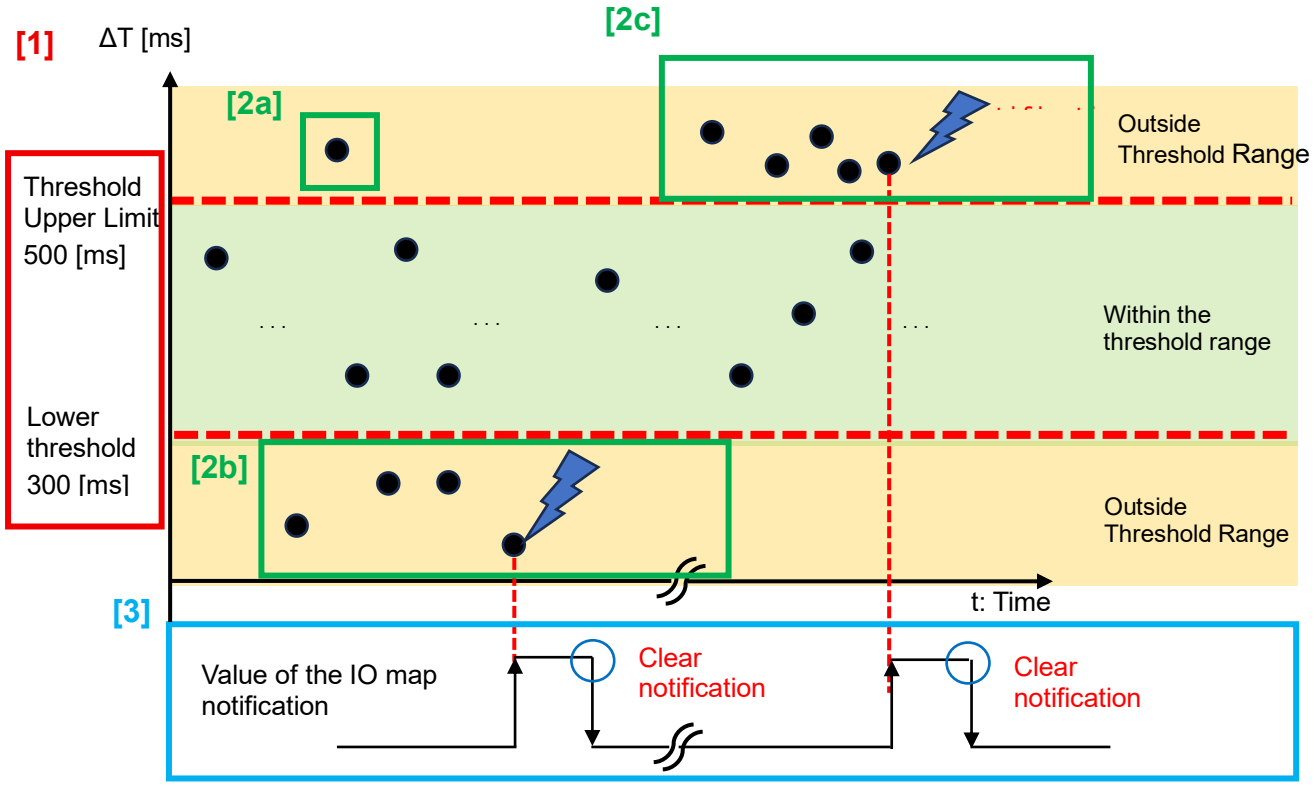
No.	Timer Ch	測定値 [ms]	閾値範囲外回数	測定回数	タイムスタンプ
56	5	1010	13	21	0days 00:24:46
55	4	458	15	21	0days 00:24:44
54	5	509	12	20	0days 00:24:43
53	4	493	14	20	0days 00:24:43
52	5	523	11	19	0days 00:24:42
51	4	416	13	18	0days 00:24:40

Excerpt from the Logging Viewer in the IO Configurator

Parameter Details and Configuration Examples

The following describes the configuration method based on the connection example below.

- Connection Example -
Compact Wireless Remote: EXW1-RMV*M5C-*
Configuration Tool: IO Configurator
Application: Install two Auto Switches (SW1 and SW2) on an air cylinder and measure the air cylinder's operating time. (See the ON/OFF Time Measurement Function.
Set a threshold for the air cylinder's operating time and a specified number of times it may exceed the threshold; receive a notification when this specified number is exceeded.



[1] Set the upper and lower threshold values for each timer

You can set the upper and lower threshold values for each timer within the range of 0 to 65535 [ms].
*The default values are an upper threshold of 0 [ms] (setting disabled) and a lower threshold of 0 [ms] (setting disabled).
*In the example above, the upper threshold is set to 500 [ms] and the lower threshold to 300 [ms].

Setting Ch0-7 | Setting Ch8-15 | Diagnostics

Item	Measurement Start Ch	Measurement Start Trigger	Measurement End Ch	Measurement End Trigger	Detection Value[ms] Upper	Detection Value[ms] Lower	Notification set point
TimerCh0	In_Ch0	Falling	In_Ch1	Rising_	0	0	5
TimerCh1	In_Ch1	Falling	In_Ch0	Rising_	0	0	5
TimerCh2	In_Ch2	Falling	In_Ch3	Rising_	0	0	5
TimerCh3	In_Ch3	Falling	In_Ch2	Rising_	0	0	5
TimerCh4	In_Ch4	Falling	In_Ch5	Rising_	0	0	5
TimerCh5	In_Ch5	Falling	In_Ch4	Rising_	0	0	5
TimerCh6	In_Ch6	Falling	In_Ch7	Rising_	0	0	5
TimerCh7	In_Ch7	Falling	In_Ch6	Rising_	0	0	5

Excerpt from the IO Configurator settings screen (page56)

[2] Set the specified number of occurrences for triggering a notification

Set the specified number of times the ON/OFF duration falls outside the threshold range defined in [1]; a notification will be sent when this number is exceeded. Set the specified number of times for each timer. Values can be set within the range of 0 to 65535 [times].

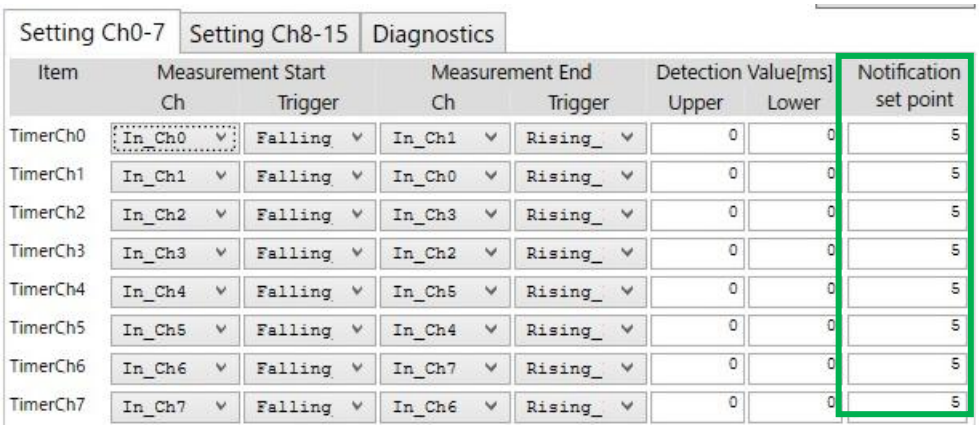
<When the specified number of occurrences is 5>

[2a] is 1 [time] outside the threshold range, and [2b] is 4 [times] outside the threshold range, for a total of 5 [times], so a notification is triggered.

After the notification is cleared, [2c] brings the total to 5 [times], so a notification is triggered.

*If the specified number of occurrences is 0, the setting is disabled.

*The default number of allowed occurrences is 5[times].



Excerpt from the IO Configurator settings screen(page56)

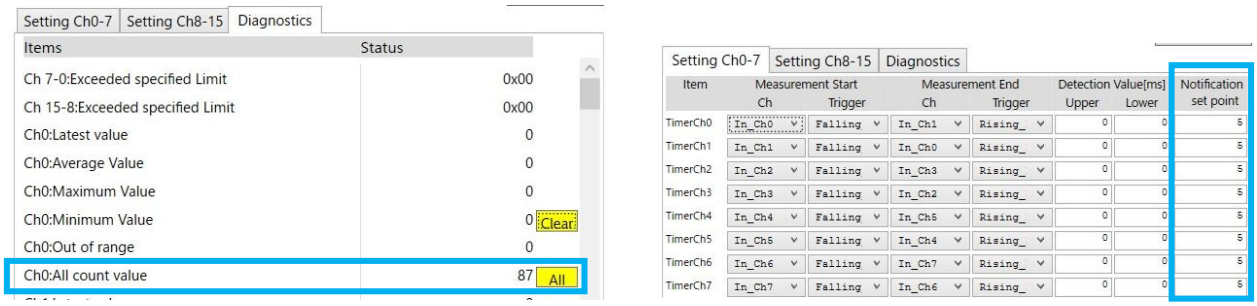
[3] Notifications and Clearing Notifications

Notifications are reflected in the product's IO map. For details, refer to "IO Map (page200)."

Notifications can be cleared by clearing the number of measurements outside the threshold (Ch #: Clear(All)) or by changing the specified number of measurements (Ch #: Notification set point).

< I/O Map for ON/OFF Count/Logger>

	Input							
	Bit 7							Bit 0
Byte N	Notification 8	Notification 7	Notification 6	Notification 5	Notification 4	Notification 3	Notification 2	Notification 1
Byte N+1	Notification 16	Notification 15	Notification 14	Notification 13	Notification 12	Notification 11	Notification 10	Notification 9

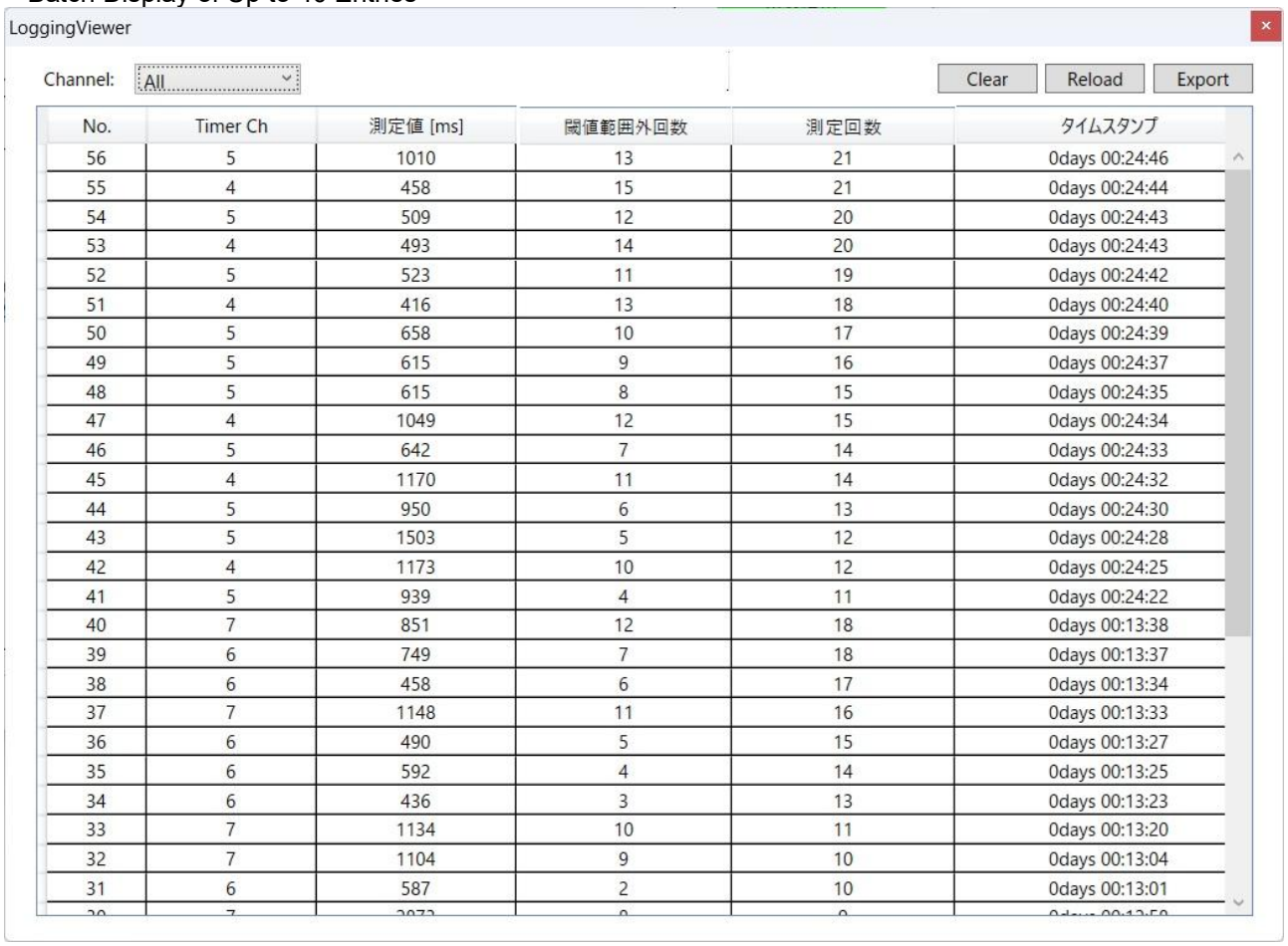


Excerpts from the IO Configurator settings screen

When viewing logs in the IO Configurator, they are displayed as shown below. You can view up to 40 entries at once, starting with the most recent log. By sorting by each timer, you can view up to 5 entries in the history.

For details, please refer to the page57.

<Batch Display of Up to 40 Entries>



No.	Timer Ch	測定値 [ms]	閾値範囲外回数	測定回数	タイムスタンプ
56	5	1010	13	21	0days 00:24:46
55	4	458	15	21	0days 00:24:44
54	5	509	12	20	0days 00:24:43
53	4	493	14	20	0days 00:24:43
52	5	523	11	19	0days 00:24:42
51	4	416	13	18	0days 00:24:40
50	5	658	10	17	0days 00:24:39
49	5	615	9	16	0days 00:24:37
48	5	615	8	15	0days 00:24:35
47	4	1049	12	15	0days 00:24:34
46	5	642	7	14	0days 00:24:33
45	4	1170	11	14	0days 00:24:32
44	5	950	6	13	0days 00:24:30
43	5	1503	5	12	0days 00:24:28
42	4	1173	10	12	0days 00:24:25
41	5	939	4	11	0days 00:24:22
40	7	851	12	18	0days 00:13:38
39	6	749	7	18	0days 00:13:37
38	6	458	6	17	0days 00:13:34
37	7	1148	11	16	0days 00:13:33
36	6	490	5	15	0days 00:13:27
35	6	592	4	14	0days 00:13:25
34	6	436	3	13	0days 00:13:23
33	7	1134	10	11	0days 00:13:20
32	7	1104	9	10	0days 00:13:04
31	6	587	2	10	0days 00:13:01

<Per Timer>



No.	Timer Ch	測定値 [ms]	閾値範囲外回数	測定回数	タイムスタンプ
15	4	458	15	21	0days 00:24:44
14	4	493	14	20	0days 00:24:43
13	4	416	13	18	0days 00:24:40
12	4	1049	12	15	0days 00:24:34
11	4	1170	11	14	0days 00:24:32

Acquired Data

For the advanced communication commands, the latest values, average values, maximum values, minimum values, the number of measurements outside the threshold, and the total number of measurements—which can be obtained via the “ON/OFF Time Measurement Function (page221)” and the “Log and Notification Functions (page226)” —are retrieved in bulk for all 16 Timer Channels, as shown in the table below.

<Latest Values, Average Values, Maximum Values, Minimum Values, and Number of Measurements Outside Thresholds>

The measurement values for each Timer Channel consist of 2 bytes of data each and are retrieved in a single batch.

Hexadecimal	**FFFE**	**EE09**	**AA21**	…	**0000**	**AA21**	**5400**
Decimal	**65534**	**60937**	**43553**	…	**0**	**43553**	**21504**
	Timer Ch 0 Measurement	Timer Ch 1 Measurement	Timer Ch 2 Measurement	…	Timer Ch 13 measurement	Timer Ch 14 measurement	Timer Ch 15 measurement

“Measurement values” refer to the latest value, average value, maximum value, minimum value, or the number of measurements outside the threshold.

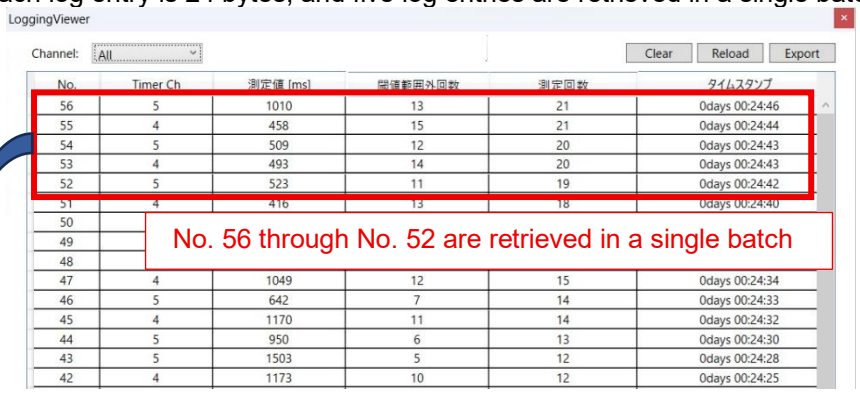
<Total Number of Measurements>

The total number of measurements for each Timer Channel is represented by 4 bytes of data, and data for all 16 Timer Channels is retrieved in a single batch.

Hexadecimal	**001545AB**	**00091101**	**0001AA21**	…	**0018BAC1**	**00000000**	**00215400**
Decimal	**1394091**	**594177**	**109089**	…	**1620673**	**0**	**2184192**
	Timer Ch 0 Total number of measurements	Timer Ch 1 Total number of measurements	Timer Ch 2 Total number of measurements	…	Timer Ch 13 Total number of measurements	Timer Ch 14 Total number of measurements	Timer Ch 15 Total number of measurements

Acquired Data Logger

For high-level communication commands, the logs that can be retrieved via the “Logging and Notification Functions (page226)” are as follows.
Each log entry is 24 bytes, and five log entries are retrieved in a single batch.



Excerpt from the Logging Viewer in the IO Configurator (page57)

Retrieved data: The following is retrieved in a batch.
The entire data set is swapped depending on the endianness of the upper-level communication.

0038 0500 03F2 000D 0000 0015 0000 0000 5892 8F80 ->Corresponds to No.56
0037 0400 01CA 000F 0000 0015 0000 0003 7F34 F880 ->Corresponds to No.55
0036 0500 01FD 000C 0000 0014 0000 0003 7488 6E00 ->Corresponds to No.54
0035 0400 01ED 000E 0000 0014 0000 0003 73EF D780->Corresponds to No.53
0034 0500 020B 000B 0000 0013 0000 0003 7357 4100 ->Corresponds to No.52

Excerpt from No. 52 (for little-endian)

Hexadecimal	0034	05	00	020B	000B	00000013	0000	See note
Decimal	52	5	0	523	11	19	0	See Note
Byte No	Bytes 0–1	Byte 2	Byte 3	Bytes4–5	Bytes 6–7	Bytes 8–11	Bytes12–15	Bytes 16–23
	Log No.	Timer Channel No.	Reserved	Measure Value	Number of times outside the threshold range	Total measurement count	Reserved	Time Stamp

Notes

<Time Stamp>

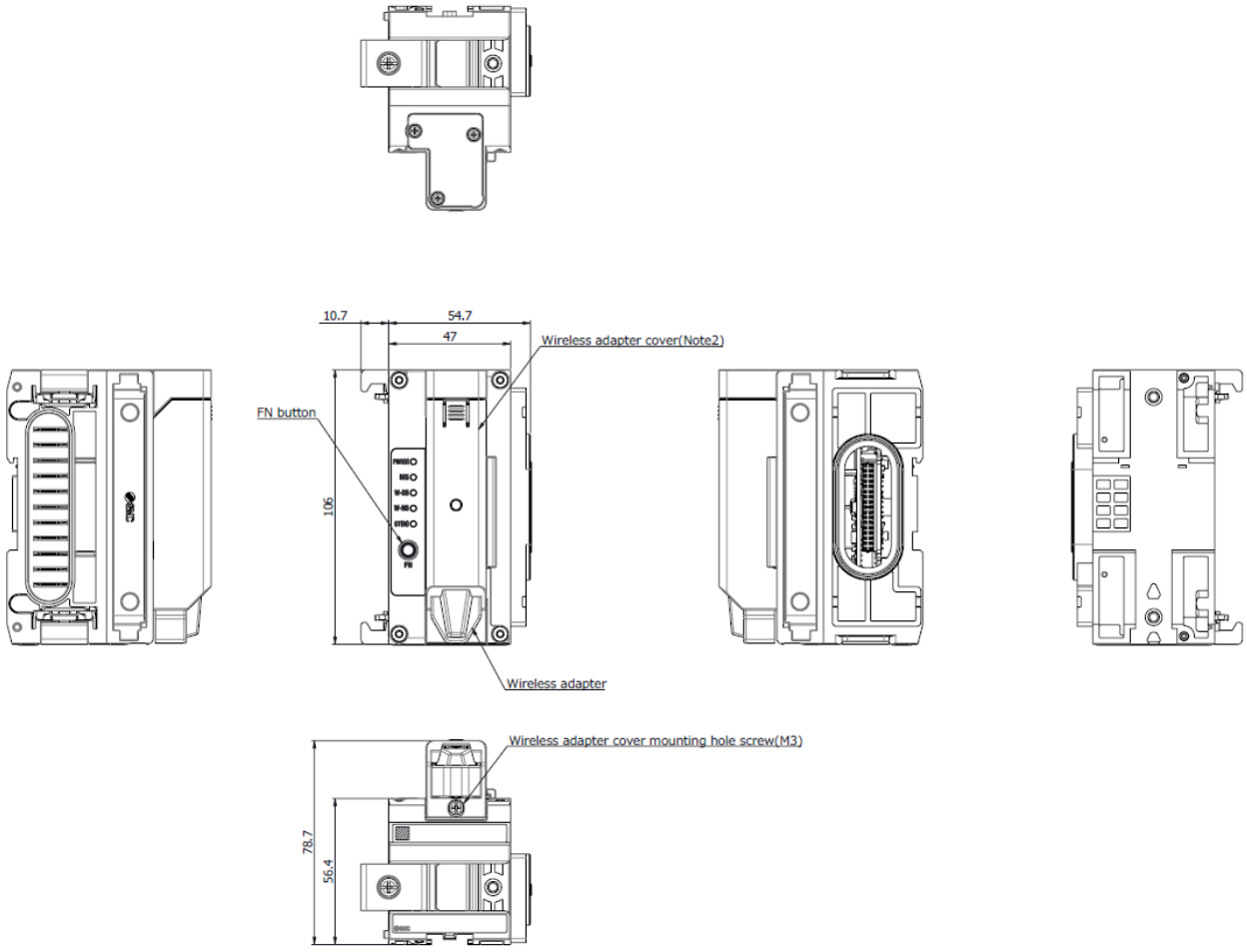
The timestamp is in LDAP/Win32 format. To convert the buffer data to a time value, first merge the four bytes of the timestamp. The resulting decimal value represents the number of 100 ns that have elapsed since January 1, 1601.

An example of timestamp calculation is shown below.

	Data[0]	Data[1]	Data[2]	Data[3]
Dec	472	38370	12261	55367
Hex	1D8	95E2	2FE5	D847
Combine	1D895E22FE5D847			
DEC	133020987706169000			

Specifications

Dimensional Drawings



Specifications

○EXW1-RMV#M5C

Wireless Communication Specifications (EXW1-A11#)

Item		Specification
Wireless Protocol		SMC Proprietary Protocol (SMC Encryption)
	Between EXW1	V.2.0 or V.1.0 (selectable)
	Between EX600-W	V.1.0
Radio Method (Spreading)		Frequency-Hopping Spread Spectrum (FHSS)
Frequency Band		2.4 GHz (2403–2481 MHz)
Number of Frequency Channels		Channels 5–79 or 15–79 (see p. 2)
Frequency Channel Selection		Supported
Channel bandwidth		1.0 MHz
Communication Speed	Wireless Protocol V.2.0	1 Mbps
	Wireless Protocol V.1.0	250 kbps
Communication Range		Up to 100 m line of sight (depending on the environment)
Countries with Radio Frequency Support		Please check our website for the latest list of countries where certification has been obtained.

Electrical Specifications

Item		Specifications	
Wireless Protocol*1		V.1.0	V.2.0
US1 (for control and input)	Power supply voltage range	24VDC±10%	
	Internal Current Consumption	50 mA or less (100 mA or less when a wireless adapter is connected)	
US2 (for output)	Power Supply Voltage Range	24VDC ±10%	
Number of input points		Max. 128 points/16 bytes	Max. 1280 points/160 bytes
Number of Output points		Max. 128 points/16 bytes	Max 1,280 points/160 bytes
Valve output	Output format	Source/PNP (Negative Common): EXW1-RMVPM5C Sink/NPN (Positive Common): EXW1-RMVNM5C	
	Number of output points	32 points (switchable between 0, 8, 16, 24, and 32 points)	
	Connected Load	DC24V, 1.0W or less, solenoid valves with surge voltage protection circuit (manufactured by our company)	
	Supply Voltage	24VDC, 2 A	
	Protection functions	Built-in short-circuit protection circuit	
Number of EX600 IO Modules That Can Be Connected		Up to 9 EX600 series IO modules (IO-Link master connection not supported)	Up to 9 EX600 Series IO modules (Up to 8 units when the configuration memory function is enabled)

***1: Please use Wireless Protocol V.1.0 as a replacement for the EX600-WSV#.**

General Specifications

Item		Specifications
Protection Rating		IP67 (when connected to the manifold)
Ambient Temperature		Operating: –10 to +55°C Storage: –20 to 60°C
Ambient Humidity		35%–85% RH (no condensation)
Vibration Resistance (Compliant with EN 61131-2)		5 ≤ f < 8.4 Hz: 3.5 mm 8.4 ≤ f ≤ 150 Hz: 9.8 m/s²
Shock Resistance (Compliant with EN 61131-2)		147 m/s², 11 ms
Standards		CE/UKCA Marking
Weight	Unit only	280 g
	Unit + accessories (Wireless adapter + adapter cover)	330 g

End plate

Model Number and Part Number System

・End Plate (D Side)

EX600-ED□-□

D-Side End Plate

Connector

Installation Method

Symbols	Description
No symbol	No DIN rail bracket
2	With DIN rail bracket (for VQC/SV/S0700 valves)
3	With DIN rail bracket (for SY/JSY valves)

Symbols	Connector	Key Type	Function
2	M12 (5-pin)	B Code	IN
3	7/8 inch (5-pin)	-	IN
4	M12 (4-pin/5-pin)	A-cord	IN/OUT (PIN Configuration1)
5	M12 (4-pin/5-pin)	A-code	IN/OUT (Pin Configuration2)

*: For details on Pin Configuration 1 and Pin Configuration 2, please refer to the Connector Pin Numbers.

・End Plate (U Side)

EX600-EU1-□

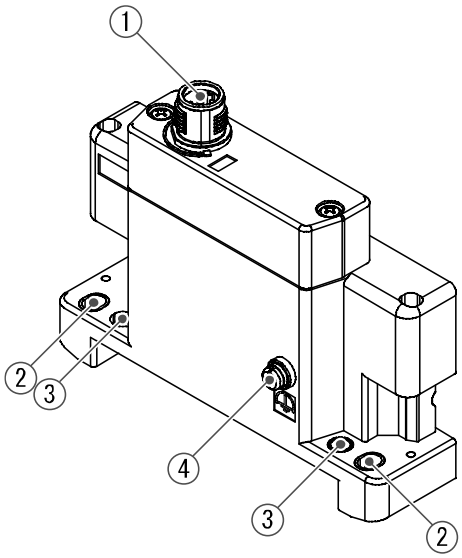
U-side End Plate

Installation Method

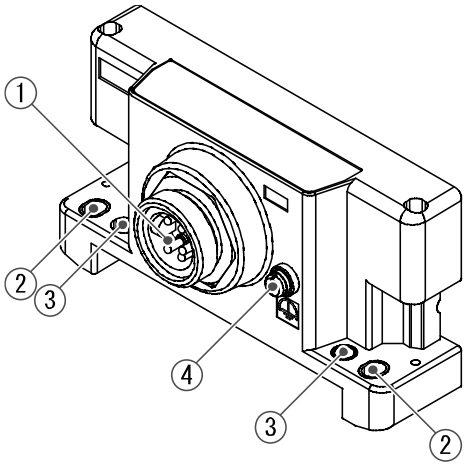
Symbols	Description
No symbol	No DIN rail bracket
2	With DIN rail bracket (for EX600-ED□-2)
3	With DIN rail bracket (for EX600-ED□-3)

Names and Functions of Product Components

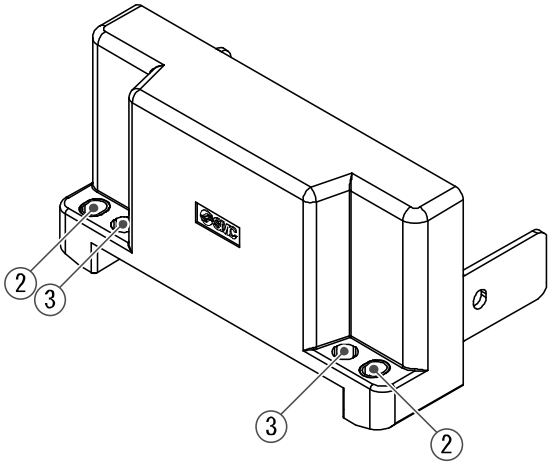
・EX600-ED2-#



・EX600-ED3-#



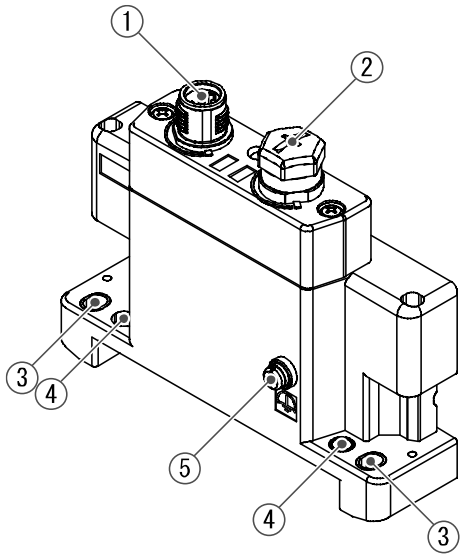
・EX600-EU1-#



No.	Name	Application
1	Power Connector	Supplies power to the unit and input/output devices.
2	Direct Mounting Holes	Used when mounting directly to equipment.
3	DIN Rail Mounting Holes	Used when configuring as a manifold and mounting on a DIN rail.
4	F.E. Terminal *	Used for grounding. Please ground the unit to improve noise immunity.

*: Use a dedicated ground connection as close to the unit as possible to minimize the grounding distance.

・EX600-ED4/ED5-#



No.	Name	Application
1	Power Connector (PWR IN)	Supplies power to the unit and input/output devices.
2	Power Connector (PWR OUT)	Supplies power to downstream devices.
3	Direct Mounting Holes	Used when mounting directly to equipment.
4	DIN rail mounting holes	Used when mounting the unit as part of a manifold on a DIN rail.
5	F.E. Terminal *	Used for grounding. Please ground the unit to improve noise immunity.

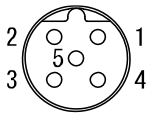
*: Use a dedicated ground connection as close to the unit as possible to minimize the grounding distance.

■ Wiring Method

○ Connector Pin Numbers

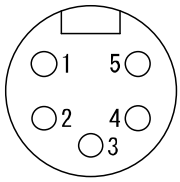
(1) EX600-ED2-#

PWR IN: M12 5-pin plug, B-code

Configuration	Pin Number	Signal Name
	1	24 V (Output)
	2	0 V (output)
	3	24 V (for control and input)
	4	0 V (for control and input)
	5	FE

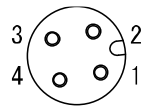
(2) EX600-ED3-#

PWR IN: 7/8-inch 5-pin plug

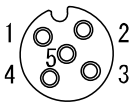
Configuration	Pin Number	Signal Name
	1	0 V (Output)
	2	0 V (for control and input)
	3	FE
	4	24 V (for control and input)
	5	24 V (for output)

(3) EX600-ED4-#

PWR IN: M12 4-pin plug, A-cable

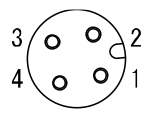
Configuration	Pin Number	Signal Name
	1	24 V (for control and input)
	2	24 V (output)
	3	0 V (for control and input)
	4	0 V (for output)

PWR OUT: M12 5-pin socket, A-cable

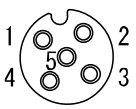
Configuration	Pin Number	Signal Name
	1	24 V (for control and input)
	2	24 V (for output)
	3	0 V (for control and input)
	4	0 V (for output)
	5	Not used

(4) EX600-ED5-#

PWR IN: M12 4-pin plug, A-cable

Configuration	Pin Number	Signal Name
	1	24 V (Output)
	2	0 V (for output)
	3	24 V (for control and input)
	4	0 V (for control and input)

PWR OUT: M12 5-pin socket, A-cable

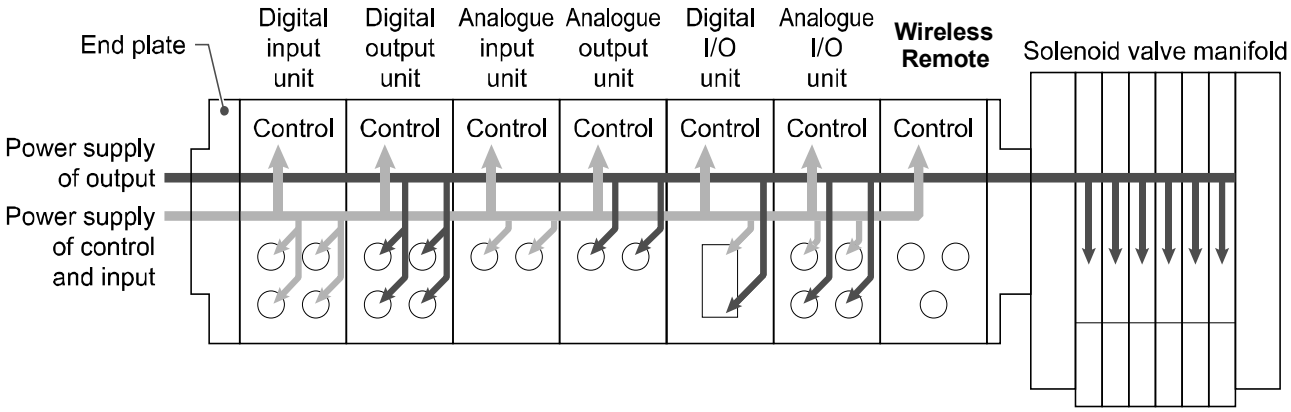
Configuration	Pin Number	Signal Name
	1	24 V (output)
	2	0 V (for output)
	3	24 V (for control and input)
	4	0 V (for control and input)
	5	Not used

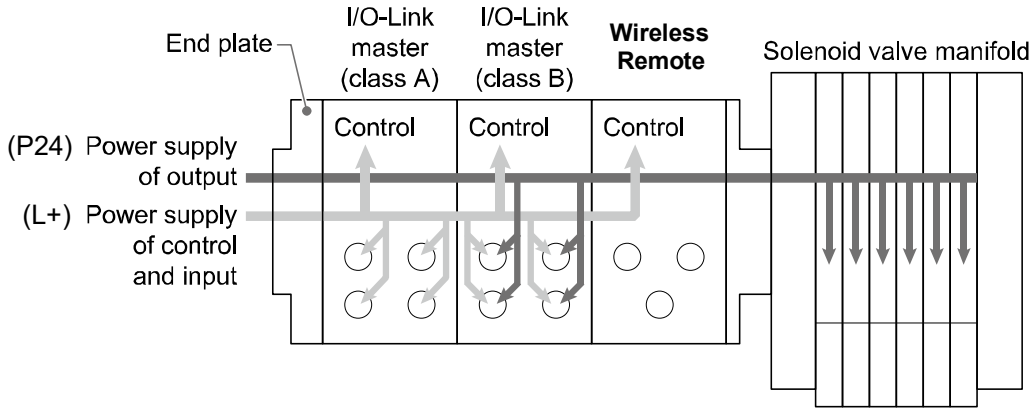
○Regarding the 2 types of power supply

The power supply consists of two power supply systems as follows:

•Power supply for control and input: Supplying power for control of each unit's power supply for control and also for device connected to input port of digital, analog, and IO-Link master unit (L+).

•Power supply for output: Supplying power for solenoid valve manifold. This also supplies power to equipment connected to the output port of digital unit, analog unit, and IO-Link master unit (P24).





● Handling Instructions

Be sure to attach the waterproof cap to any unused connectors. Proper use of this waterproof cap ensures compliance with the IP67 protection rating.

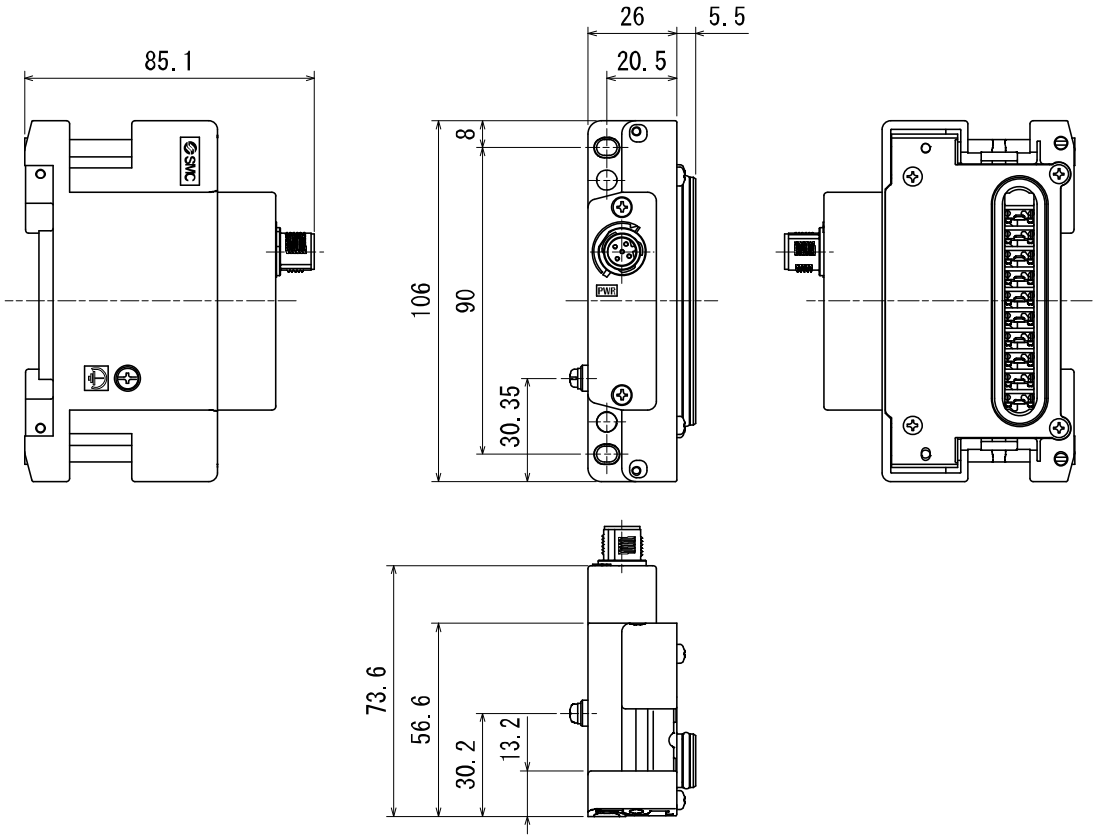
Specifications

Model			EX600-ED2-#	EX600-ED3-#	EX600-ED4-#	EX600-ED5-#
Power Specifications	Power Connector	PWR IN	M12 (5-pin) Plug	7/8 inch (5-pin) Plug	M12 (4-pin) Plug	M12 (4-pin) Plug
		PWR OUT	-	-	M12 (5-pin) Socket	M12 (5-pin) Socket
	Power Supply (for Control and Input)		24VDC±10%, 2A	24VDC±10%, 8A	24VDC±10%, 4A	
	Power Supply (for Output)		24VDC±10%, 2A	24VDC±10%, 8A	24VDC±5%, 4A	
Environmental Resistance	Enclosure Rating		IP67 compliant (when connected to a manifold) Note 1			
	Operating Temperature Range		-10 to 50 °C			
	Storage Temperature Range		-20 to 60 °C			
	Operating Humidity Range		35–85% RH (no condensation)			
	Withstand voltage		500 V AC, 1 min. Between all external terminals and FE			
	Insulation resistance		DC 500 V, 10 MΩ or more Between all external terminals and the FE			
Standards			UL/CSA (E209424), CE/UKCA Marking		CE/UKCA Marking	
Weight			170 g	175 g	170 g	

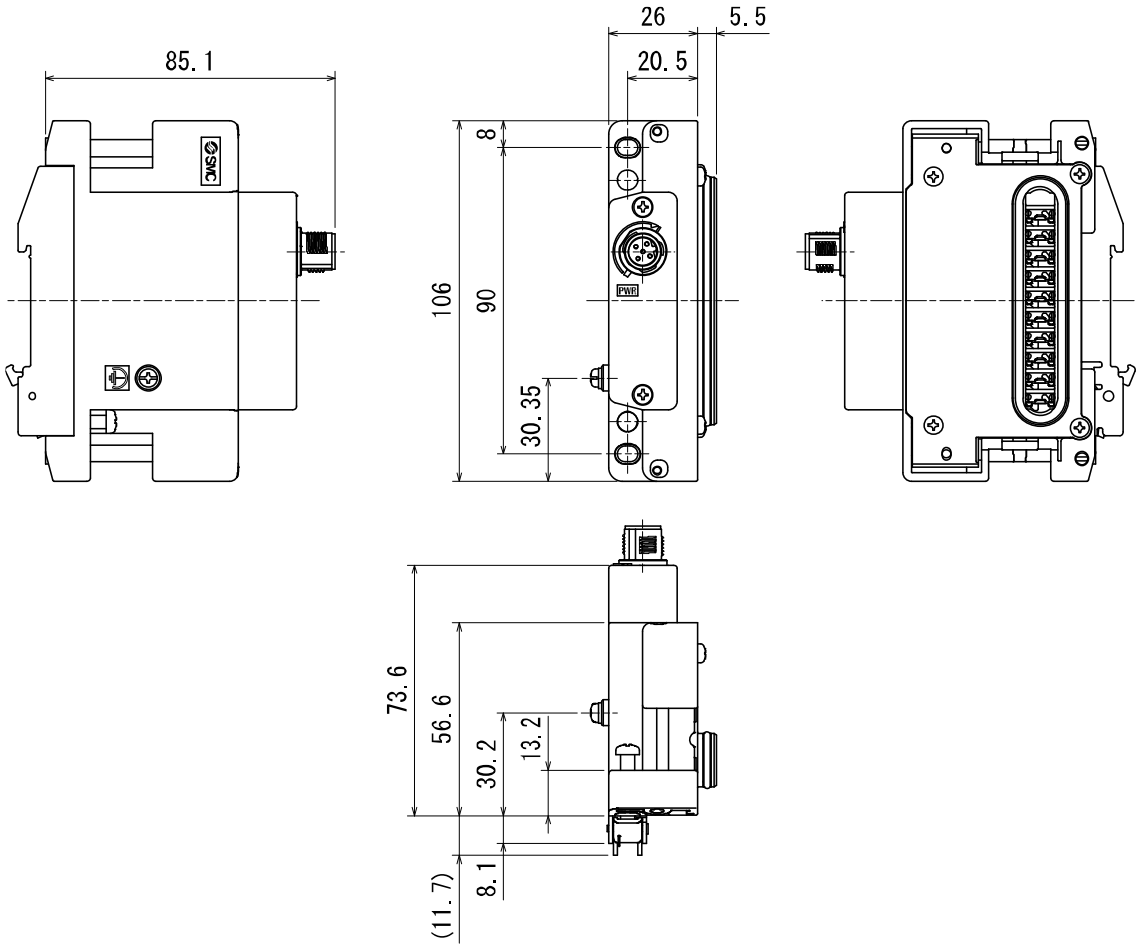
*1: Please attach waterproof caps to unused connectors.

■ External Dimensions Diagram

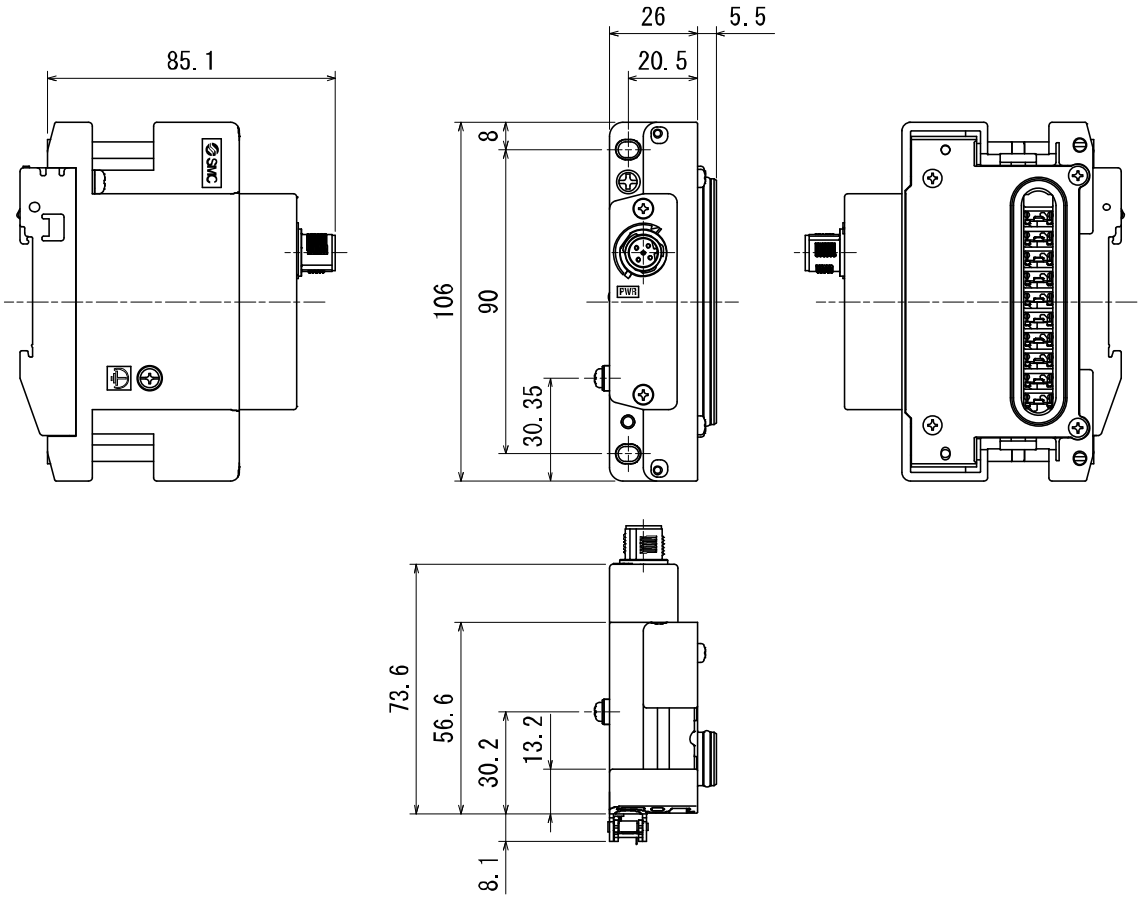
・EX600-ED2



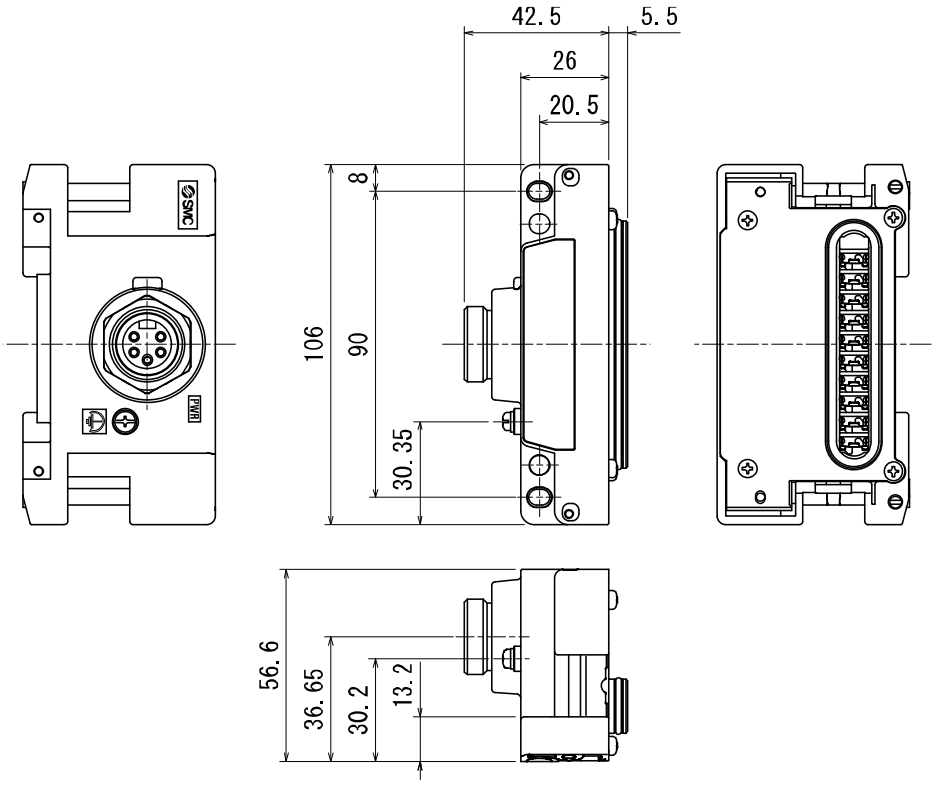
・EX600-ED2-2



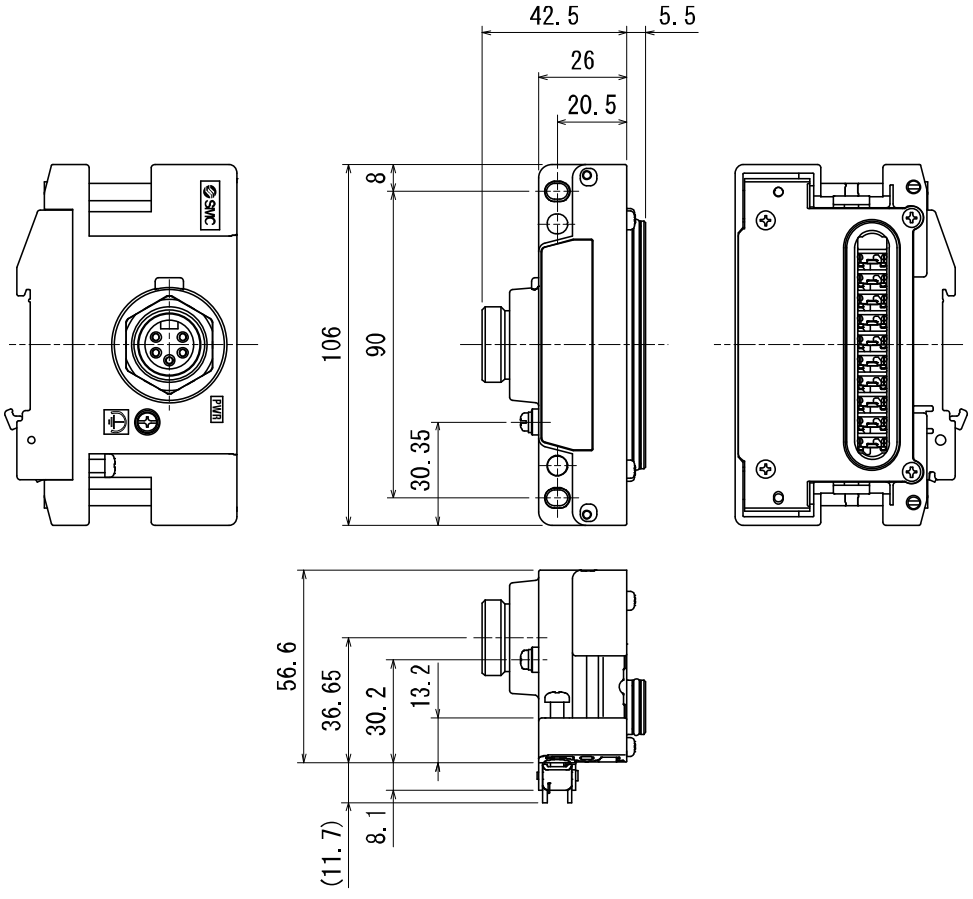
・EX600-ED2-3



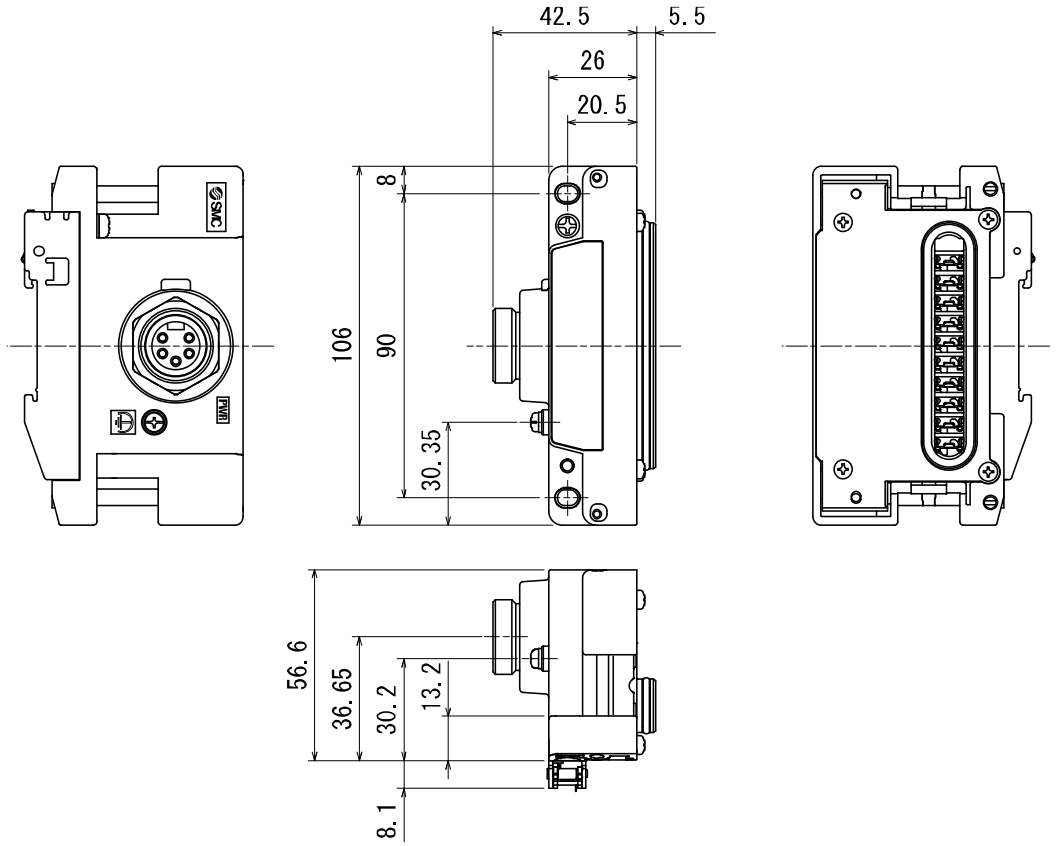
・EX600-ED3



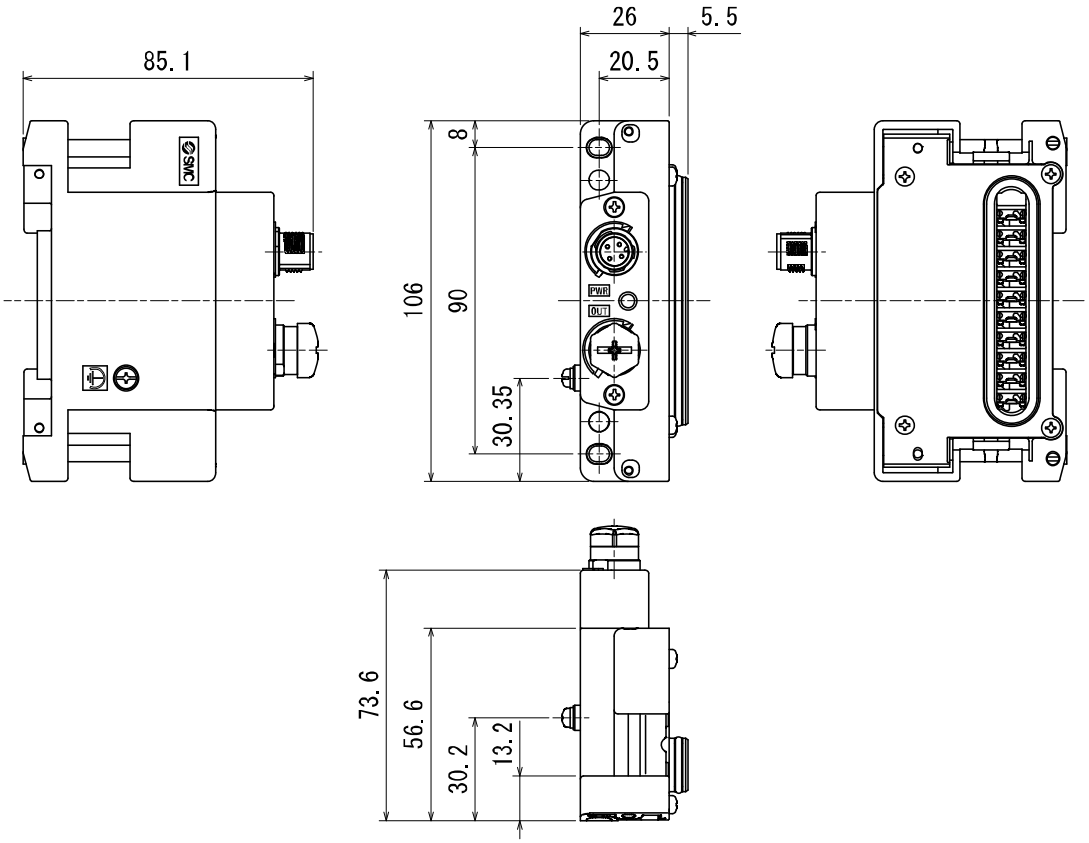
・EX600-ED3-2



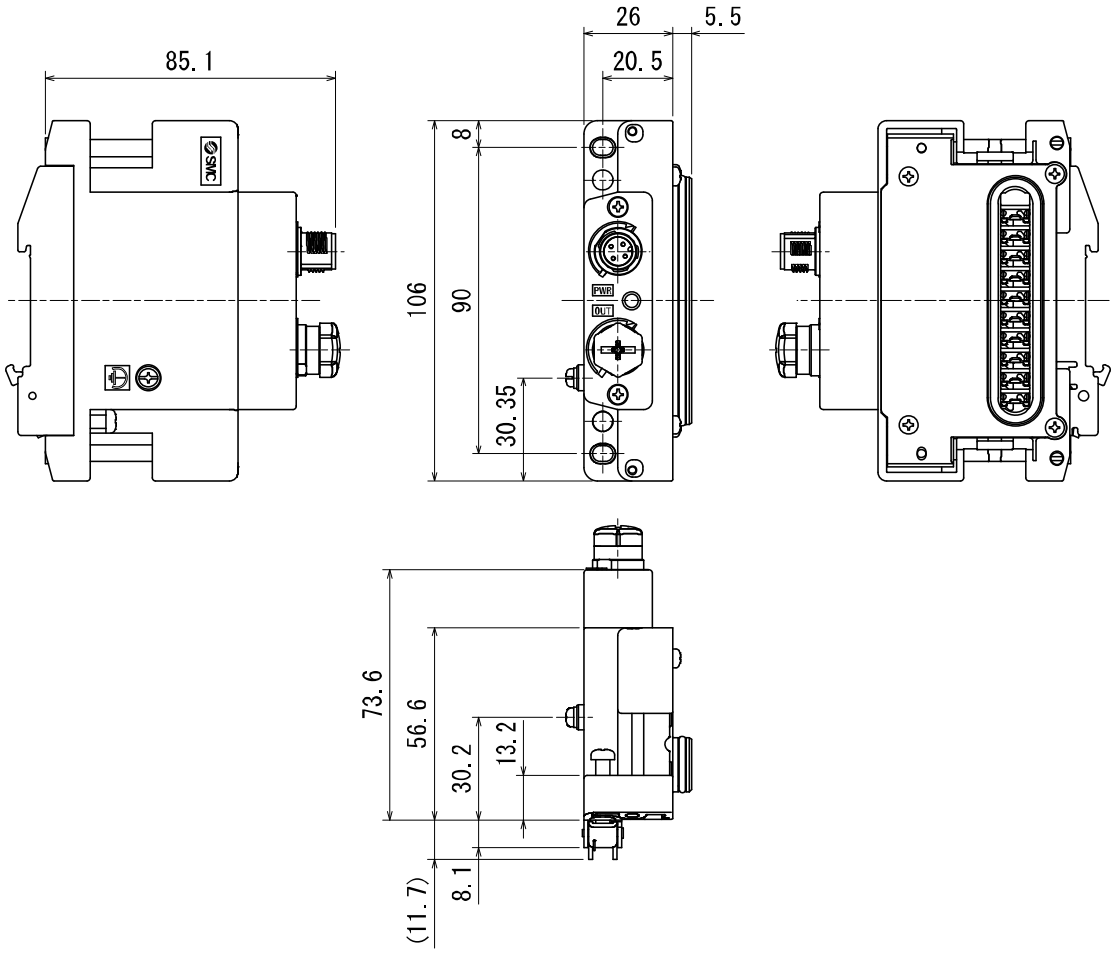
・EX600-ED3-3



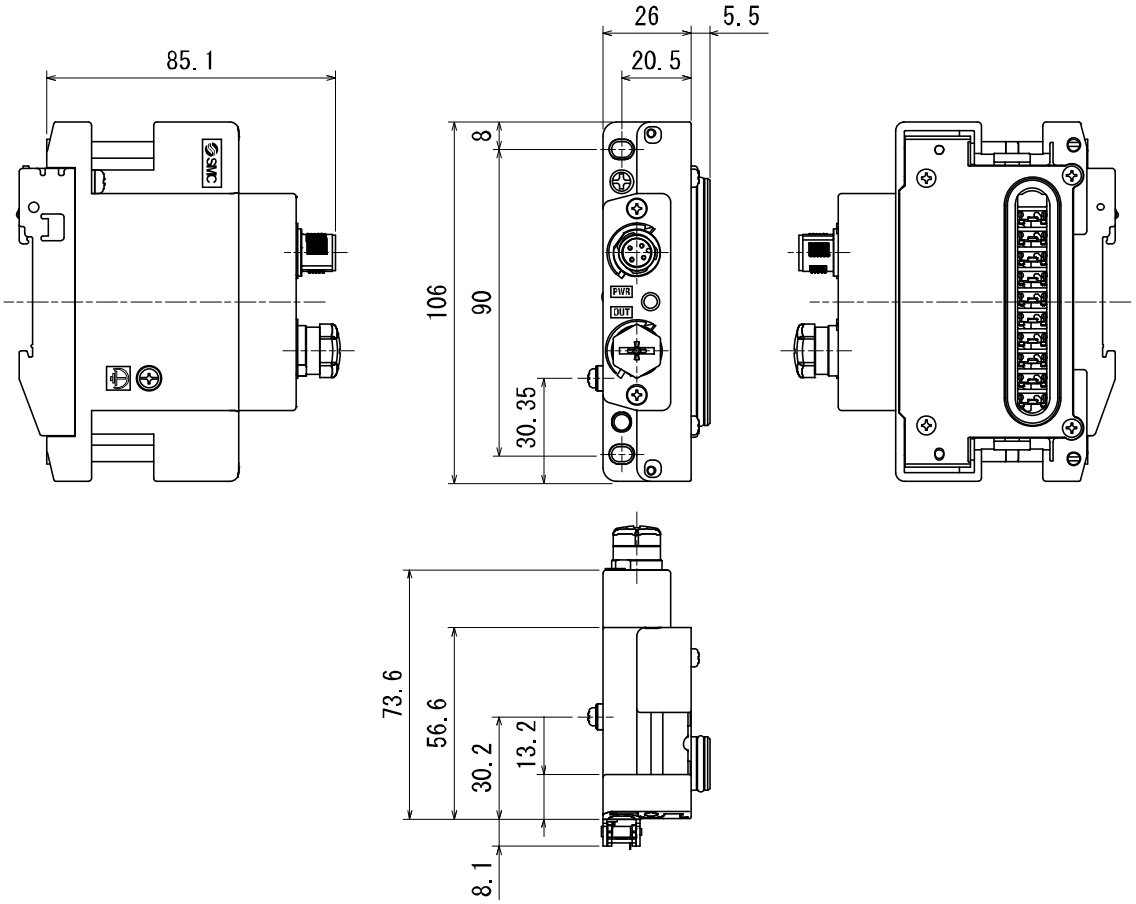
・EX600-ED4/ED5



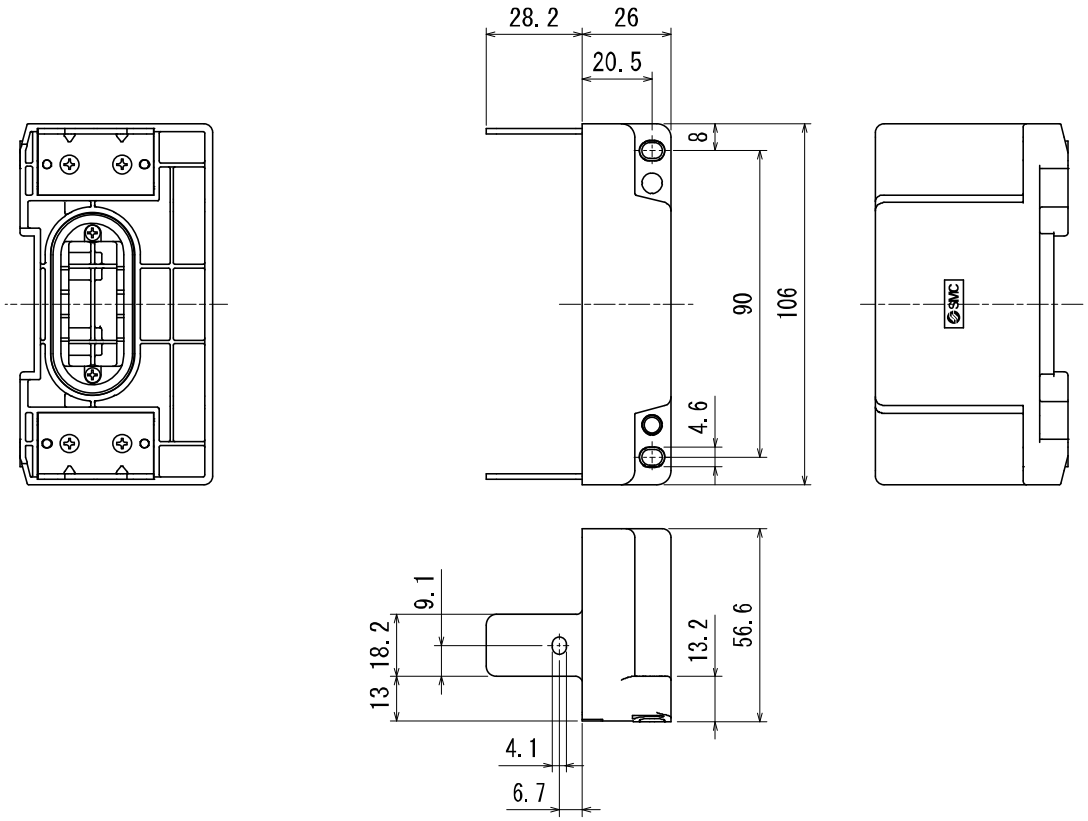
・EX600-ED4/ED5-2



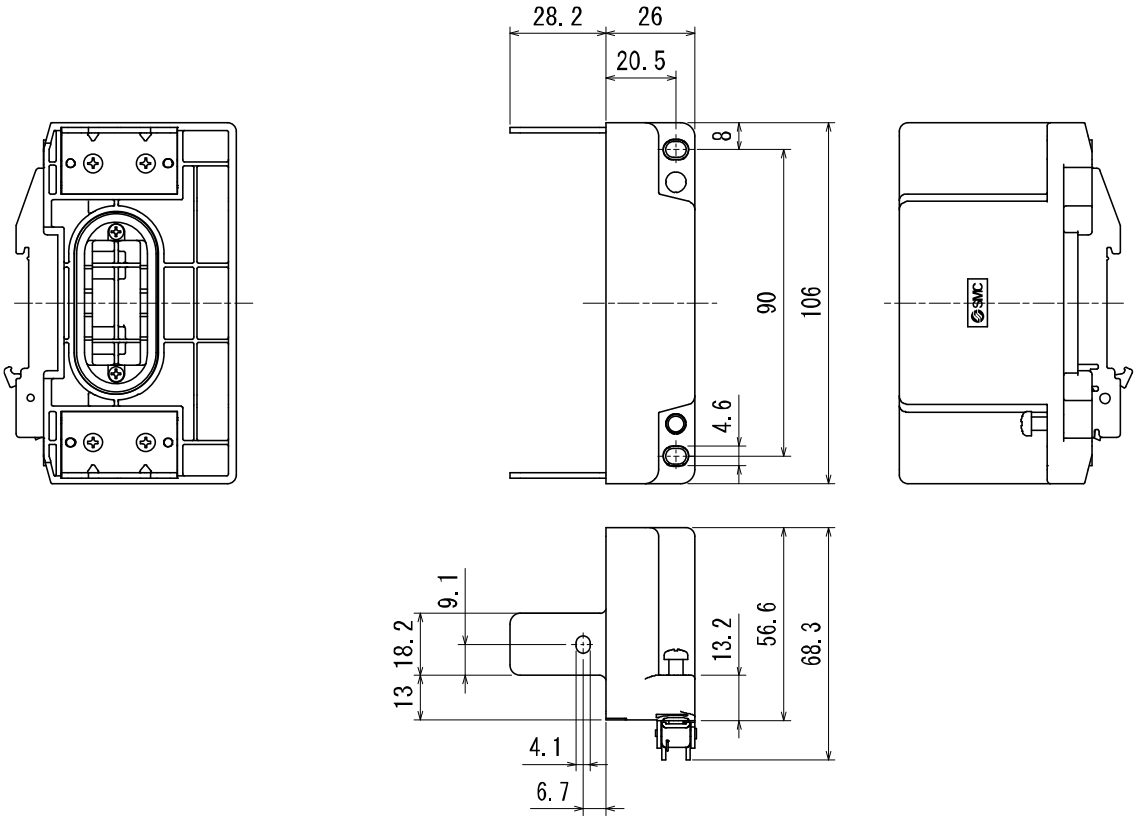
・EX600-ED4/ED5-3



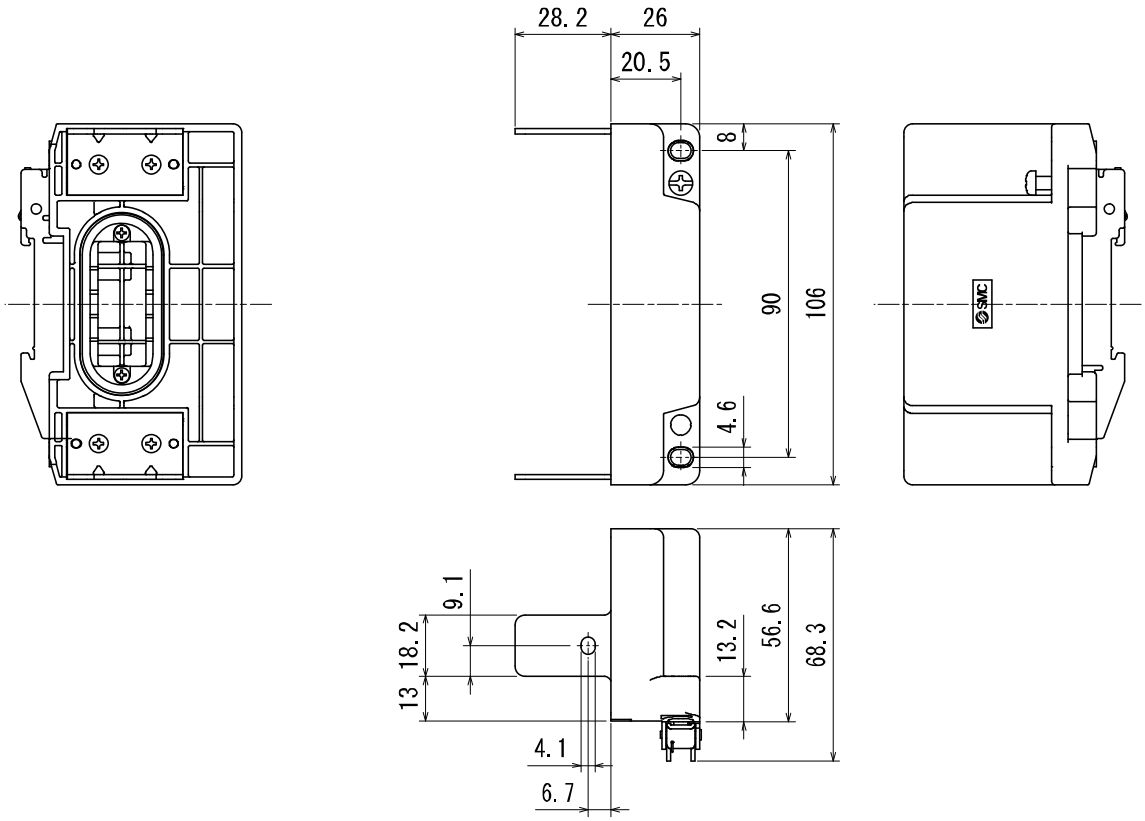
・EX600-EU1



・EX600-EU1-2



・EX600-EU1-3



Accessories

Please refer to the catalog or our website when selecting a model.

URL: https://www.smcworld.com

Revision history

SMC Corporation

URL https://www.smcworld.com

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